

THE

Gentleman's Diary,

OR THE

MATHEMATICAL REPOSITORY;**An ALMANACK****For the YEAR of our LORD 1747.****Being the Third after BISSEXTILE,
or LEAP-YEAR.**

Containing many useful and entertaining Particulars,
peculiarly adapted to the ingenious Gentlemen en-
gaged in the Study and Practice of the

MATHEMATICKS.

The Seventh *Almanack* ever publish'd of this Kind.

— Quâ causâ argentea Phœbe
Pessibus haud æquis graditur; cur subdita nulli
Hactenus Astronomo numerorum fræna recusat:
Cur remeant Nodi, curque Auges progrediuntur.

— Quantis refluxum vaga Cynthia pontum
Viribus impellit; dum fractis fluctibus ulvam
Deserit, ac Nautis suspectas nudat arenas,
Alternis vicibus suprema ad littora pulsans.

L O N D O N,

Printed for the Company of STATIONERS.
MDCCLVII.

Continuation and Conclusion of the History of
Geometry, by Mr. THO. LEDIARD.

ARISTOTLE'S Books are all full of Mathematical Arguments: Two of his Scholars are especially celebrated: Eudemus, who compos'd a Mathematical History; and Theophrastus, who wrote Two Books of Numbers. Four of Geometry, and One of Indivisible Lines. To Aristotle, Isidore, and Hypsicles we are indebted for the Books of Solids. Lastly, Euclid of Alexandria, gathering together the Inventions of others, dispos'd them into Order, improv'd and demonstrated them more accurately, and left us those Elements which lay a solid Foundation for all the Branches of Mathematical Knowledge: He taught in the Reign of Ptolemy Lagus, A. R. 454. The Two last Books are attributed to Hypsicles, and not to him. He died A. A. C. 284. He was followed about 100 Years after, by Eratosthenes and Archimedes; the Name of the former was very famous; but his Writings are lost. We have many Remains of Archimedes, but more are supposed to be lost. Polybius, Plutarch, and others, have delivered us his Inventions. From him proceeded that Saying, $\Delta\delta\epsilon\ \omega\upsilon\tau\ \sigma\omega\ \mu\epsilon\ \tau\epsilon\ \gamma\iota\upsilon\alpha\ \nu\iota\omega\kappa\epsilon\iota$, i. e. Let me have where to stand, and I will move the Earth which way I please. Conon was Contemporary to him: He was a Geometrician and Astronomer, and his Death is lamented by Archimedes, in his Book of the Quadrature of the Parabola: These were followed by Apollonius of Perga, who was called the Great Geometrician. There are now extant seven Books of his Conics. To him are also ascribed the Fourteenth and Fifteenth Books of Euclid, which were contracted by Hypsicles. Hipparchus wrote Twelve and Menelaus Six Books

Rise, Progress, &c. of GEOMETRY. 3

Books of *Subsenses* in a Circle; there are also extant Three Books of the latter concerning *Spherical Triangles*. *Theodosius* wrote Three Books of *Spherical Triangles*, which are yet pretty well known.

In the Year of CHRIST 70 flourished *Claudius Ptolemy*: He was not only most famous in *Astronomy*, but in *Geometry* also; which (besides other things written by him) his Books of *Subsenses* do especially testify. He contracted the Six Books of *Menelaus*, and Twelve of *Hipparchus* into Five *Theorems*.

Plutarch's Mathematical Problems are still extant; and many are to this Day sensible of the learned Commentaries of *Eutocius* on *Archimedes*.

The Inventions of *Philo*, *Diocles*, *Nicomedes*, *Sporus*, *Heron*, concerning Doubling the Cube are recited by him. The Genius of the latter was excellent both for *Mechanicks* and *Geometry*; his doubling the Cube is likewise recommended by *Pappus* before all others.

The Works of *Ctesibius*, to whom we owe the Invention of *Pumps*, are celebrated by *Proclus*, *Pliny*, and *Athenaeus*. The Name of *Geminus* is not in the lowest Place among *Mathematicians*; *Nicomachus* was famous for *Arithmetical*, *Geometrical*, and *Musical Monuments*; and *Serenus* well known for his Two Books concerning the Section of a *Cylinder*.

Proclus, *Pappus*, and *Theon* are also celebrated among the Antients: The learned Commentaries upon *Euclid* by *Proclus*, shew what a Geometrician he was: The Praises of *Theon* also, are deservedly great; but I shall conclude with *Pappus*, the last in Time among the Ancients, but in Reputation ought to be reckoned the first; he was of *Alexandria*, the most fruitful City of Great Men, and liv'd in the Year of CHRIST 400; the Two first of the Seven Books of his *Mathematical Collections* are lost; the other Five abound

4 *An Historical Account, &c.*

with so many various, and most noble Inventions, in almost every Part of the *Mathematicks*, that they are esteemed among the chief Monuments of the *Antient* which have come down to us.

F I N I S.

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ALL Persons who are pleased to be CONTRIBUTORS, by answering the QUESTIONS, *ÆNIGMA'S*, &c. in this DIARY; or by sending new Questions, *Ænigma's*, Paradoxes, or other Subjects fitting for this WORK, are desired (for the future) to send them, and their Solutions along with them, before the first Day of *May* 1747, directed for the Authors of the Gentleman's Diary, to be left with Mr. JOSEPH HOW, at the *White Horse* in Cripplegate, London: (Post paid, or they will not be receiv'd.)

JANU

JANUARY hath xxxi Days.

	Day	D	Breaks.	Decl.
First Quarter	7 Day at 2 Afternoon	6	5 49	20 44
Full Moon	15 Day at 3 in the Afternoon	12	5 43	19 16
Last Quarter	22 Day at 5 in the Afternoon	18	5 36	17 54
New Moon	29 Day at 3 in the Afternoon	24	5 32	16 12
		31	5 15	14 0

1	T	Circumcision. New Years Day	legs	5	14	1	21
2	F	<i>Windy Weather may about this</i>	ank.	7	8	2	10
3	S	<i>Time be expected,</i>	feet	8	33	2	56
4	D	2 Sunday after Christmas	toes	9	50	3	41
5	M	<i>with Plenty of Snow</i>	head	11	6	4	23
6	T	Epiph. or Ch. Appear. to Gent.	and	Morn.	5	3	
7	W	Days 8 ho. long and Nights 16	face	0	18	5	46
8	T	<i>or Rain, but not</i>	neck	1	31	6	27
9	F	Flouring. Epip. Fair is al.	thro.	2	44	7	13
10	S	ways the 1st Fr. aft. Jan. 2.	arms	4	3	8	0
11	D	1 Sunday after Epiphany	shou.	5	14	8	53
12	M	<i>very cold.</i>	shou.	6	15	9	46
13	T	Hillary. Marriage comes in	brea.	7	5	10	42
14	W	Ox. Hil. and Cam. Lent. T. beg	stom	7	37	11	32
15	T	Day 8 hours 26 min. long	hear.	Rises	Morn.		
16	F	Days increased and Nights	back	5	N 30	0	19
17	S	shortened 1 hour 14 min.	bow	6	46	1	10
18	D	2 Sunday after Epiphany	and	8	16	1	58
19	M	Days 8 hours 4 min. long.	belly	9	30	2	46
20	T	Prince of WALES born <i>Cold</i>	reins	11	4	3	30
21	W	Agnes. Winds and pretty	loins	Morn.	4	17	
22	T	<i>much inclined to Frost,</i>	seet.	0	33	5	10
23	F	Hillary Term begins	blad.	2	0	6	0
24	S	<i>with frequent</i>	hips	3	39	7	0
25	D	3 S. aft. Epiph. S. Paul's Conv.	thig.	4	54	8	3
26	M	Days 9 hours 6 min. long	kne.	5	58	9	6
27	T	Quind. Hill. 2 Ret.	ham.	6	38	10	5
28	W	<i>Drifts of Snow, or perhaps</i>	legs	7	8	11	3
29	T	<i>Rain towards the End.</i>	ank.	Rises	11	56	
30	F	K. CHARLES I. martyr'd at	feet	6	N 3	0	A 44
31	S	Wh. H. 12 m. past 1. 1648-9	toes	7	21	1	28

M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercu.	Watch
D	Rises.	Sets.	Rises.	Rises.	Rises.	Rises	Rises	too fast.
6	8	13	59	12 N 27	6 M 36	12 N 44	7 M 17	6 M 20
12	7	52	4	8	12	16	12	32
18	7	42	4	18	12	32	6	35
24	7	31	4	11	39	6	0	12
31	7	18	4	11	12	5	40	12
				10	43	5	18	12
							0	5
							6	6
							48	14
							48	14

FEBRUARY XXVIII Days.

First Quarter 6 Day at 11 in the Morning	6	5	3	11 S	57
Full Moon 14 Day at 5 in the Morning	12	4	54	9	48
Last Quarter 21 Day at 1 in the Morning	18	4	40	7	39
New Moon 28 Day at 6 in the Morning	24	4	28	5	19
	28	4	18	3	40

Sundays, Holy Days, remarkab. D's		Moon's		Moon's	
M	W	Days, Length, Incr. and Dec. signs	Ris. and	South-	
D.	S.	of Days, Terms, Weather, etc.	Setting.	ing.	

1	D	Sunday after Epiph.	toes	8 N 35	2 A 10
2	M	Purification, or Candlemas Day	h ad	9 46	2 51
3	T	Craft. Purif. 3 Return	face	11 6	3 34
4	W	Cold winds	neck	Morn.	4 11
5	T	Days 9 hours 52 min. long	and	0 24	5 1
6	F	may now or about this	thro.	1 41	5 51
7	S	Time be expected,	arms	3 0	6 40
8	D	Sunday after Epiph.	sho.	3 58	7 31
9	M	with Rain or Sleets of Snow,	brea.	4 55	8 23
10	T	Octab. Purif. 4 Return	sto.	5 32	9 17
11	W	Days 10 hours 8 min. long	hear.	6 0	10 11
12	T	but for the most part	and	6 23	11 0
13	F	Term ends	back	6 37	11 40
14	S	Valentine. Marr. goes out	bow	Rises	Morn.
15	D	Septuagesima Sunday	belly	7 N 19	0 37
16	M	pretty open weather.	reins	8 44	1 21
17	T	Days 10 hours 36 min. long	loin.	10 14	2 0
18	W	Now more fair, but	seer.	11 45	3 1
19	T	Sun rises 38 min. past 6,	blad.	Morn.	4 0
20	F	and sets 22 min. past 5	hips	1 18	4 50
21	S	inclined to Frost, and	rhig.	2 44	5 58
22	D	Sexagesima Sunday. Princess of	knee	3 56	6 59
23	M	Henry born	ham.	4 47	8 1
24	T	St. MATTHIAS the Apostle	legs	5 16	8 59
25	W	Days 11 hours 8 min. long	and	5 40	9 51
26	T	somewhat windy towards	ankl	5 50	10 40
27	F	the latter End of the Month.	feet	6 0	11 25
28	S	Days increas'd 4 hours 2 min.	toes	6 8	0 A 9

M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Merco.	Watch							
D	Rises.	Sets.	Rises.	Rises.	Sets.	Rises.	Rises.	too fast							
6	7	6	4	54	10 N 20	4 M 58	11 N 51	4 M 52	6 M 46	14	34				
12	6	54	5	6	9 51	4	40	11 36	5	4	46	13	59		
18	6	40	5	20	9 26	4	20	11 36	5	4	38	6	41	12	47
24	6	28	5	32	9 44	4	21	11 11	4	4	33	6	37	11	27
28	6	20	5	40	8 48	3	49	11 0	4	4	30	6	30	10	24

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MARCH hath 31 Days

Day
Breaks
Declin

First Quarter 8 Day at 8 in the Morn.
Full Moon 15 Day at 5 in the Afternoon
Last Quarter 22 Day at 8 in the Morn.
New Moon 29 Day at 9 at Night

1	Quinquag. or Shrove	David	head	7	N 39	0	A 50
2	M Thad B. Fair and frosty		face	8	56	1	40
3	Shrove Tu. Da. 11 h. 34 min.		neck	10	11	2	27
4	Wh Wedn. or first Day of Lent		thro.	11	28	3	0
5	T at the Beginning. and for		thro.	Morn		3	48
6	F most part pretty dry weather		arms	0	44	4	37
7	S Days 11 hours 50 min. long.		sho.	1	53	5	19
8	Quadragesima, 1 Sun. in Len.		brea.	2	58	6	19
9	M may be expected. ☉ enters ♈		and	3	42	7	19
10	T Equal Day and Night thro' the		stom	4	7	8	6
11	Wember Week [habitable World		heart	4	32	8	54
12	T About this Time expect		back	4	49	9	45
13	F Days increased 4 ho. 54 min.		bow	5	110	31	
14	Prince EDWARD born		belly	5	14	11	21
15	2 Sunday in Lent. Reminisce		reins	7	Rises	Morn.	
16	M rough Winds.		loins	7	N 53	0	11
17	T Days 12 h. 34 min. long		feet	9	31	1	0
18	W Still windy.		blad.	11	11	1	56
19	T with frequent Storms		hips	Morn		2	54
20	F Guthbert		thigh	0	40	3	59
21	S of Hail; and Rain		kne.	1	59	5	1
22	3 Sunday in Lent. Oculi		and	2	54	6	4
23	M with Sleets of Snow		ham	3	29	7	3
24	T may also be expected.		legs	3	50	7	58
25	Ann. of V. Mar. or LADY DAY		ankl.	4	6	8	47
26	T Now more fair and		feet	4	39	8	33
27	F Days 13 ho. 12 min. long		toes	4	28	10	15
28	S Frosty towards		head	4	37	10	56
29	4 Sund. in Lent. Mid Lent Sun.		and	Sets	11	37	
30	M the latter End.		face	8	A 3	0	A 21
31	T Day 13 ho. 31 min. long		neck	9	21	1	4

M.	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercur.	Watch								
D	Rises.	Sets.	Rises.	Rises.	Rises.	Rises.	Rises.	too fast								
6	6	7	5	53	1 M	52	3 M	29	10 N 43	4 M 24	5 N 29	3	40			
12	5	54	6	61	25	3	10	10	20	4	19	7	12	6	50	
18	5	42	6	18	1	3	2	50	10	0	4	14	8	0	5	0
24	5	30	6	30	0	40	2	30	9	36	4	9	8	25	3	7
30	5	15	6	45	0	12	2	7	9	6	4	18	33	1	5	5

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APRIL hath xxx Days.										M	Day	Sun's
										D	Break.	Decl.
First Quarter 7 Day at 1 in the Morning										62	31	10N
Full Moon 14 Day at 2 in the Morning										122	32	12
Last Quarter 20 Day at 5 in the Afternoon										182	32	14
New Moon 28 Day at 1 in the Afternoon										241	53	16
										30	1	35
1	W	All Fools Day	thro.	10	N	34	1	A	50			
2	T	Cloudy weather for the	arms	11		49	2		40			
3	F	most part with cold Rain,	and	Morn.			3		30			
4	S	or Hail. Days 13h 56min. long	tho.	0		53	4		19			
5	D	Sunday in Lent. Judica	brea.	1		40	5		5			
6	M	Sun rises 6 min. past 5	stom	2		18	6		0			
7	T	About this Time expect some	heart	2		42	6		54			
8	W	Sun sets 58 min. past 6	and	3		2	7		41			
9	T	Fruitful Showers.	back	3		15	8		29			
10	F	Days increas'd and Nights	bow	3		30	9		16			
11	S	shorten'd 6 hours 46 min.	belly	3		37	10		5			
12	T	6 Sunday in Lent. Palm Sund	reins	3		48	10		56			
13	M	Showery Weather till	loins	3		59	11		48			
14	T	Days 14 hours 18 min. long	seer.	Rises		Morn.						
15	W	Prince WILLIAM born	blad.	10	N	17	0		45			
16	T	after the Full Moon.	hips	11		49	1		50			
17	F	GOOD FRID. Our SAV. Crucifi	thig.	Morn.			2		55			
18	S	Now expect fair and pleasant	knee	0		51	4		0			
19	D	EASTER DAY. Our SAV. Resham		1		36	5		2			
20	M	Easter Monday	legs	2		1	5		55			
21	T	Easter Tuesday	ankl.	2		19	6		50			
22	W	Weather, but	feet	2		33	7		37			
23	T	St. George Pav. of Ch. & Fort.	and	2		42	8		21			
24	F	pretty warm, and perhaps	toes	2		52	9		3			
25	S	St. MARK the Evangelist	head	3		2	9		45			
26	D	1 Sund. after Easter; Low Sund	face	3		13	10		26			
27	M	Marriage comes in	neck	3		23	11		7			
28	T	some Thunder Claps.	and	Sets		11			53			
29	W	Dr. and Cam. Term begins	thro.	9	N	36	0	A	40			
30	T	Days 15 hours 12 min. long.	arms	10		48	1		30			
M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercu.	Watch				
D	Rises.	Sets.	South.	Rises.	South.	Sets.	Rises.	too slow.				
6	5	6	54	11	46	1	M 45	1	M 9			
12	4	55	7	5	11	2	1	24	0			
18	4	44	7	16	10	57	1	2	0			
24	4	34	7	26	10	33	0	38	11			
30	4	24	7	36	10	9	0	15	11			

MAY hath xxxi Days.					M. Day	Sun's Decl.		
					D	Breaks		
1	Quarter 9	Day at 4	Afternoon		6	0 58 19 Nat		
2	Full Moon	13	Day at 9	in the Morning	12	No 20 36		
4	1st Quarter	20	Day at 3	in the Morning	18	real 21 40		
6	New Moon	28	Day at 4	in the Morning	24	Night. 22 28		
7					31	23 7		
A 50	F St. PHILIP and JACOB				sho.	Fr N 31 28 18		
40	S Fair and pleasant at the Beginning.				brea.	Morn. 3 10		
30	D 2 Sund. after Easter M ^{er} icordi				and	0 19 4 4		
19	M	Quind. Pasch.	1	Return	stom	0 46 4 56		
5	T	<i>but somewhat warm.</i>			heart	1 8 5 40		
0	W	Term begins			back	1 23 6 28		
54	T	Days incr. & Ni. sho. 8 h. 18 m.			bow	1 36 7 13		
41	F	Days 15 hours 38 min. long			belly	1 49 7 56		
29	S	Now more windy			reins	2 0 8 41		
16	D	3 Sunday after Easter Jubilate			loins	2 11 9 37		
5	M	Tres Pasch. 2 Return			feet	2 21 10 34		
56	T	<i>wish frequent Showers may</i>			blad.	2 38 11 29		
48	W	Days 15 ho. 48 min. long			hips	D Rises Morn.		
orn.	T	<i>about this time be expected.</i>			thig.	10 N 34 0 35		
45	F	Sun rises 5 min. past 4.			kne.	11 30 1 41		
50	S	and sets 55 min. past 7.			ham	Morn. 2 46		
55	D	4 Sunday after Easter,			legs	0 3 3 50		
0	M	Menf. Pasch. 3 Return.			ankl.	0 22 4 44		
2	T	<i>Brisk Gales of Wind.</i>			feet	0 41 5 36		
55	W	Days incr. & Ni. sho. 8 h. 40 m			and	0 51 6 20		
50	T	<i>and showery Weather.</i>			toes	1 2 7 0		
37	F	Days 16 ho. and 5 min. long			head	1 11 7 43		
21	S	<i>Marriage goes out</i>			face	1 20 8 24		
3	D	5 Sun. after Easter, Rogat. Pr			neck	1 30 9 6		
45	M	Quin. Pasch.	4	R. GEOR. bo	and	1 42 9 50		
26	T	<i>Still showery;</i>			thro.	1 58 10 36		
7	W	<i>but, towards the End more cold</i>			arms	2 25 11 23		
53	T	Holy Thursday, CHR. Ascen.			sho.	D Sets 0 A 15		
40	F	K. Ch. II. Rest. Craft. Af. 5 R			brea.	10 N 11 1 8		
30	S	Prs. AM. & CAP. b. and cloudy			ind	10 50 1 58		
ch	D	6 Sunday after Easter, Exaudi			stom	11 13 2 46		
ow.								
26	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercu.	Watch
39	Rises.	Sets.	Sets.	Rises.	South.	Rises.	Rises.	too slow.
48	4 1	7 45	3 M 14	11 N 48	10 N 32	3 M 0	3 M 40	4 9
33	4 8	7 52	2 50	11 33	9 58	2 48	3 25	3 49
58	4 1	7 58	2 24	10 59	9 31	2 37	3 13	3 11
	3 55	8 5	2 0	10 32	9 3	2 25	3 3	2 19
	3 51	8 9	1 29	10 1	8 33	2 13	2 55	1 3

JUNE hath 30 Days

	Mo	Day	Sun
First Quarter	5	Day at 2 in the Morning	6
Full Moon	11	Day at 4 in the Afternoon	12
Last Quarter	18	Day at 3 in the Afternoon	18
New Moon	26	Day at 7 in the Afternoon	24

	Term Ends	This Month begins	heart	11	N	30	3	A	32
1	Days	16 hours 26 min. long	ack	11	40	4	18		
2	with fair and hot weather	and	bow	12	50	5	6		
3	Oxford and Cambr. Terms end		belly	Morn.	4	48			
4	may be expected to continue		reins	0	2	6	33		
5	so for a few Days.		ind	0	13	7	19		
6	Whit-Sunday Desc. of H. Ghost		win.	0	24	8	10		
7	Whit Monday	Brisk Gales	secr.	0	36	9			
8	Whit Tuesday	Lo. Day 16h. 43m.	plad.	0	58	10			
9	☉ in ☿ 10 h. 48m. p. ☿	Ember	hips	1	31	11	19		
10	St. GEORGE II. Ina. St. Barnab.		thig.	Rises	Morn.				
11	☽ of wind, with fine cooling Showers.		kne.	9	N 56	0	13		
12	☽ Now more inclined to Heat,		ham	10	25	1	25		
13	Trinity Sund. Marr. comes in		legs	10	42	2	24		
14	St. GEORGE II. proclaimed		ankl.	10	55	3	19		
15	☽ but not without some Showers.		feet	11	4	4			
16	☽ Ox. and Camb. Terms begin		toes	11	13	4	51		
17	☽ Now expect brisk Winds		head	11	22	5	34		
18	☽ Term begins		face	11	32	6	19		
19	☽ but not much wet.		neck	11	45	6	58		
20	☽ Sunday after Trinity		and	Morn.	7	39			
21	☽ Octab. Trin. 2 Return		thro.	0	1	8	29		
22	☽ Very hot and perhaps		arms	0	21	9	19		
23	☽ St. John Bapt. Midsum. Day		sho.	0	52	10			
24	☽ St. John's C. Dr. Election		hand	1	34	10	58		
25	☽ some Claps of Thunder,		brea.	Sets	11	48			
26	☽ but fine cooling Gales		stom	9	N 13	0	A 37		
27	☽ 2 Sund. aft. Trin. Qu. Tr. 3 ret.		heart	9	32	1	27		
28	☽ St. PETER and St. PAUL		back	9	44	2	18		
29	☽ with flying Showers toward End.		bow	9	58	2	57		

M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercur.	Watch
D	Rises.	Sets.	Sets.	Rises.	Sets.	Rises.	Sets.	too fast
6	3 39	8 21	1 M 0 9 N 30	12 N 52	1 M 58	7 N 30	0	11
12	3 39	8 21	0 36 9	3 12 29	1 52 7	58	1	24
18	3 40	8 20	0 11 8	35 12 4	1 43 8	20	2	29
24	3 44	8 16	11 N 43	Sets. 11 46	1 39 8	33	3	51
30	3 48	8 12	11 18 3	M 8 11 25	1 38 8	42	4	51

JULY hath xxii Days

M Day Sente
D Breaks Declin

1st Quarter 4 Day at 9 in the Morn.
Moon 10 Day at 12 at Night
2nd Quarter 18 Day at 6 in the Morn.
New Moon 26 Day at 9 in the Morning

6 No rest at N 16
12 Night 20 7
18 0 12 18 48
24 1 7 17 18
31 1 44 15 20

Cloudy at the Beginning
Days decreased 27 min.
Days 16 hours 16 min. long
and perhaps some
Sunday after Trinity
Showers of Rain Tref. T in 4ret.
Tho. a Becket. Cambz. Com.
Term ends
Now more inclin'd to Heat,
Cambridge Term ends
Days shortened 46 min.
Sunday after Trinity
Showers and Claps of Thunder
Days 15 hours 49 min. long
Within Still hot, and pretty
Days decreas'd and Nighs
increased 1 hour 3 min.
fair about this Time.
Sunday after Trinity
Dog Days begin
Frequent Showers may
Mary Magdalen
Day 15 hours 23 min. long
Magdalen Coll. Dr. Elect.
St. JAMES the Apostle
Sunday after Trinity
Days 15 hours 8 min. long
about this Time be expected.
Sun rises 30 minutes past 4.
and sets 30 minutes past 7.
Princess ANNE born

bow 10 N 4 3 A 39
belly 10 15 4 21
reins 10 26 5 9
loins 10 39 5 58
blad. 10 57 6 50
feet 11 21 7 50
hips Morn. 8 49
thigh 0 1 9 56
knee 1 2 11 1
ham 1 Rises Morn.
legs 8 N 36 0 18
ankl. 8 50 1 0
feet 9 5 1 54
toes 9 16 2 39
head 9 25 3 26
and 9 35 4 8
face 9 47 4 50
neck 10 0 5 33
tho. 10 20 6 19
arms 10 50 7 8
and 11 27 7 56
sho. Morn. 8 47
brea. 0 22 9 39
stom 1 28 10 30
heart 2 44 11 20
and 1 Sets 0 A 8
back 8 N 4 0 54
bow 8 14 1 39
belly 8 25 2 20
reins 8 36 3 7
loins 8 47 3 51

M	Sun	Sun.	Saturn	Jupiter	Mars	Venus	Mercur.	Watch
D	Rises.	Sets.	Sets.	Sets.	Sets.	Rises.	Sets.	too fast
6	3 55	8 5	11 N 0	2 M 41	11 N 6	1 M 41	9 N 3	5 31
12	4 3	7 57	10 36	2 10	10 44	1 50	8 52	5 54
18	4 12	7 48	10 12	1 47	10 26	1 58	8 35	5 53
24	4 21	7 39	9 50	1 23	10 9	2 10	8 15	5 34
31	4 34	7 26	9 24	0 54	9 50	2 28	8 43	4 44

AUGUST hath xxxi Days.

	M	Day	Sun's
	D	Breaks.	Decl.
First Quarter 2 Day at 3 Afternoon	6	2	7 13
Full Moon 9 Day at 8 in the Morning	12	2	27 11
Last Quarter 16 Day at 11 at Night	18	2	47 9
New Moon 24 Day at 9 at Night	24	3	6 7
First Quarter 31 Day at 8 at Night	31	3	25 4

1	S	Lammas Day Cloudy Weather	blad.	9	N	5	4	A	44
2	D	7 Sunday after Trinity	seer.	9	26	5	42		
3	M	at the Beginning,	hips	0	0	6	45		
4	T	Days 14 hours 38 min. long	thig.	10	54	7	46		
5	W	but very little wet.	kne.	Morn.		8	47		
6	T	Days decreas'd 2 h. 13 min.	ham	0	4	9	48		
7	F	Now aspect is more hot. with	legs	1	30	10	49		
8	S	☉ Amplitude 20° 00'	and	3	0	11	49		
9	D	8 Sunday after Trinity	ankl.	D	Rises	Morn.			
10	M	Laurence (perhaps) Thunder;	feet	7	N	27	0	50	
11	T	☉ due East at 6h. 38'. Alt. 15° 0'	toes	7	37	1	14		
12	W	but pretty fair, and (for the	head	7	47	2	1		
13	T	Day 14 hours 2 min. long	face	7	58	2	44		
14	F	most part) good Harvest Weather.	neck	8	10	3	39		
15	S	Stump. B. W.	and	8	30	4	10		
16	D	9 Sunday after Trinity	thro	8	58	5	9		
17	M	☉ Amplitude 17° 44'	arms	9	31	5	51		
18	T	Day 13 hours 44 min. long	sho	10	18	6	49		
19	W	Some Showers of Rain	brea	11	18	7	38		
20	T	Sun rises 12 min. past 5;	and	Morn.		8	39		
21	F	and sets 48 min. past 6.	stem	0	30	9	18		
22	S	may be expected now,	heart	1	52	10	8		
23	D	10 Sunday after Trinity	back	3	13	10	54		
24	M	St. BARTHOLOMEW	bow	5	Sets	11	40		
25	T	Days decreased and Nights	belly	6	N	37	0	A	27
26	W	increased 3 hours 12 min.	reins	6	49	1	10		
27	T	Dog Days end	loin	7	0	2	0		
28	F	Days 13 hours 3 min. long	seer.	7	15	2	50		
29	S	and towards the End.	and	7	34	3	40		
30	D	11 Sunday after Trinity	blad.	8	4	4	40		
31	M	Days 12 hours 50 min. long	hips	8	51	5	49		

M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercur.	Watch
D.	Rises.	Sets.	Sets.	Sets.	Sets.	Rises.	Sets.	too fast
6	4 45	7 15	9 N	0 12 N 24	9 N 33	2 M 46	7 N 20	3
12	4 57	7 3	8 40	12 2	9 20	3 4	6 53	2
18	5 8	6 53	8 19	11 40	9 8	3 25	Rises	0
24	5 20	6 40	7 57	11 16	8 56	3 45	4 M 42	1 slow
31	5 35	6 25	7 33	11 53	8 45	4 13	4 0	3

Sun Rises.	Sun Sets.	Saturn Sets.	Jupiter Sets.	Mars Sets.	Venus Rises.	Mercur. Rises.	Watch too low
5 47	6 13	7 N 16	10 N 35	8 N 40	4 M 38	4 M 15	46
6 0	6 0	6 57	10 17	8 32	5 0	4 26	43
6 13	5 47	6 35	9 57	8 26	5 10	5 39	42
6 25	5 35	6 14	9 37	8 21	5 42	5 45	15
6 37	5 23	6 54	9 16	8 17	6 4	6 24	10

OCTOBER hath xxxi Days

	M	Day	Sun
	D	Break	Dec
Full Moon	Day at 10 in the Morn	6 4	50 9 8
Last Quarter	15 Day at 2 in the Afternoon	12 5	0 11
New Moon	2 Day at 8 at Night	18 5	11 13
First Quart	7 29 Day at 11 in the Morn	24 5	22 15
		31 5	33 17

1	A	This Month begins with	legs	Morn.	7	N	4
2	F	Days dec. and Ni. incr. 6 h. 3m. ankl.		0	17	8	3
3	S	foggy Mists, and frequent	feet	1	40	9	2
4	D	16 Sunday after Trinity	toes	3	4	10	1
5	M	Showers may also be expected.	head	4	24	11	
6	T	Days 10 hours 19 min. long	and	5	55	11	5
7	W	Nights 13 h. 45 min. long	face	2	Rises	Morn.	
8	T	Now more windy and	neck	4	N	59	0
9	F	Dennes	thro.	5	18	1	
10	S	Dxt. and Camb. Terms begin	sho.	5	45	1	5
11	D	17 Sun. af. Trin. K. Geo. II. C	arme	6	25	2	4
12	M	Rain withal may about	hand	7	16	3	9
13	T	Days 9 hours 50 min. long	brea.	8	17	4	2
14	W	this Time be expected.	stom	9	25	5	1
15	T	Sun rises 8 min past 7;	heart	10	40	6	
16	F	Sun sets 50 min. past 4.	ribs	11	59	6	5
17	S	Brisk Winds may still	back	Morn.	7	4	
18	D	18 Sun. af. Trin. S. Luke E	bow	1	21	8	2
19	M	be expected; but pretty	belly	2	39	9	
20	T	Tres Mch. 1 Ret.	reins	4	2	9	5
21	W	moderate; and for the	joins	5	30	10	4
22	T	Princess of ORANGE born	blad.	D	Sets	11	3
23	F	Michaelmas Term begins	sect.	4	N	23	0
24	S	most part fine pleasant	hips	5	11	1	3
25	D	19 Sunday after Trin. Crispin thig.		5	57	2	4
26	M	Weather; which is likely	kne.	7	10	3	4
27	T	Menf. Mich. 2 Return	ham	8	36	4	4
28	W	St. SIMON and JUDE Apostles	legs	10	7	5	4
29	T	to continue throughout	ankl	11	31	6	3
30	F	K. GEORGE II. born 1683	feet	Morn.	7	24	
31	S	the whole Month.	toes	0	53	8	

M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercur.	Watch
D	Rises	Sets	Rises	Sets	Sets	Rises	Sets	too slow
6	6 50	5 10	7 M 10	8 N 59	8 N 13	6 M 25	5 N 18	14 35
12	7 1	4 58	6 55	8 40	8 14	6 48	5 7	15 34
18	7 14	4 46	6 35	8 32	8 14	Sets	5 0	16 7
24	7 26	4 34	6 25	8 3	8 15	4 N 42	4 52	16 13
31	7 37	4 23	6 55	7 40	8 16	4 33	4 48	15 44

NOVEMBER hath xxx Days

Day Break Decl.

Full Moon 6 Day at 3 in the Morn. 6 5 40 19 8 3
 1st Quarter 14 Day at 8 in the Morn. 12 5 46 20 12 4
 New Moon 21 Day at 6 in the Morn. 18 5 52 21 32
 1st Quarter 27 Day at 11 at Night 24 6 58 22 26
 30 6 02 23 3

D 20 Sund. aft. Trinity. All Saints toes 2 14 8 N 51
 M All Souls Sleet or head 3 28 9 33
 T Craft. Ani. 3 Return face 4 47 10 18
 W Showers, but for the neck 6 6 11 2
 T Gun Powder Plot anno 1605 and 7 20 11 50
 F Day 8 hours 21 min. long thto. D Rises Morn.
 S most part pleasant Weather sho. N 19 0 38
 D 21 Sunday after Trinity arms 4 56 11 27
 M for the Season. brea. 6 3 2 20
 T Days decreased 8 hours 32 min. and 7 14 3 4
 W Martin Bishop of Tours stom 8 26 3 57
 T Craft. Mart. 4 Return heart 9 43 4 43
 F Now rough Winds may back 10 59 5 29
 S be expected, but bow Morn. 6 12
 D 22 Sunday after Trinity belly 0 14 6 57
 M mostly warm Weather reins 1 31 7 44
 T Day 7 hours 52 min. long flank 2 50 8 25
 W Octab. Mart. 5 Return loins 4 16 9 18
 T for the Season. blad. 5 50 10 11
 F for the Season. sect. 7 20 11 10
 S Days 7 hours 41 min. long hips D Sets 0 A 13
 D 23 Sunday after Trinity thig. 4 N 35 1 20
 M Days decreased 9 h. 6 min. kne. 5 58 2 24
 T Now expect more cold ham 7 34 3 26
 W Quip. Mar. 6 Ret. Catharine legs 9 6 4 19
 T Day 7 hours and half long ankle 10 34 5 12
 F and Frostlike Weather, and feet 11 53 5 58
 S Term ends toes Morn. 16 40
 D 24 Sunday towards the End head 1 15 7 24
 M St. ANDR. Appar. goes out face 2 25 8 7

Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercur.	Watch
Rises.	Sets.	Rises.	Sets.	Sets	Sets	Sets.	ton flow
7 47	4 13	5 M 10	7 N 12	8 N 18	4 N 20	4 N 44	14 26
7 5	4 5	5 9	7 4	8 19	4 18	4 42	13 10
8 2	3 58	4 48	6 42	8 20	4 13	4 39	11 18
8 7	3 53	4 25	6 35	8 21	4 8	4 30	8 56
8 3	3 50	4 3	6 43	8 21	4 17	4 30	6 15

DECEMBER hath xxxi Days.

Full Moon 5 Day at 10 at Night	6 5	1 23 8 2
Last Quarter 13 Day at Midnight	12 6	1 23 2
New Moon 20 Day at 4 in the Afternoon	18 6	1 23 1
First Quarter 27 Day at 1 in the Afternoon	24 5	50 22 5
	31 5	53 21 5

1 T	At the Beginning of this	neck	3 M 44	8 N 5
2 W	Day 7 h. 21 min. long	and	5 0	9 3
3 T	Month expect cold Rain,	thro	6 15	10 2
4 F	Days decreas'd 9 ho. 23 min.	arms	7 23	11 1
5 S	or perhaps Snow.	sho.	8 Rises	Morn.
6 D	Sunday in Advent	brea.	3 N 45	0
7 M	Princess LOUISA born	and	4 53	0 5
8 T	Sleets or Showers.	stom	6 2	1 4
9 W	Shortest Day at Nott. is 7h. 19m.	heart	7 19	2 3
10 T	at London 7 ho. 38 min.	back	8 33	3 2
11 F	☉ in ♍ at 3 h. 42 m. in Morn.	bow	9 48	3 5
12 S	Days shorten'd 9 hours 24 min.	and	11 4	4 4
13 D	Sunday in Advent Lucy	belly	Morn.	5 2
14 M	Days increas'd 1 Minute	reins	0 21	6 4
15 T	Dark, cold, and cloudy	loins	1 41	6 4
16 W	Ember Week	blad.	3 6	7 3
17 T	Day 7 hours 21 min. long	seer.	4 33	8 3
18 F	Weather; perhaps Snow	hips	6 4	9 3
19 S	or cold Rain.	thig.	7 27	10 4
20 D	Sunday in Advent	kne.	8 Sets	11 5
21 M	St. THOMAS the Apostle	ham	4 N 44	0 A 5
22 T	Now more fair, and inclin'd	legs	6 21	1 5
23 W	Days increased 4 minutes	ankl.	7 54	2 4
24 T	to Frost; but pleasan for the	feet	9 21	3 4
25 F	CHRISTMAS DAY Season.	toes	10 42	4 2
26 S	St. STEPHEN Proto-Martyr	head	Morn.	5 7
27 D	1 Su. af. Christm. St. JOHN Ev.	and	0 2	5 5
28 M	Innocents, or Herod's Murd. Inf.	face	1 17	6 3
29 T	Days increased 8 minutes	neck	2 32	7 2
30 W	Rough Winds may be expected to	thro.	3 49	8 0
31 T	conclude the Year.	arms	5 6	8 5

M	Sun	Sun	Saturn	Jupiter	Mars	Venus	Mercury	Watch
D	Rises.	Sets.	Rises.	Sets.	Sets.	Sets.	Rises.	too slow
6	8 32	3 48	3 M 46	5 N 47	8 N 25	4 N 24	7 M 1	3 22
12	8 33	3 47	3 16	5 28	8 25	4 25	6 55	0 20
18	8 11	3 49	2 54	5 7	8 26	4 26	6 24	2 fast 10
24	8 30	3 52	2 28	4 47	8 27	5 3	6 23	5 30
21	8 3	3 57	2 C	4 27	8 27	5 21	6 24	8 30

A TABLE of all the Kings and Queens of England since the Conquest.

The Year of the Birth of each King and Queen; also the Year, Month, and Day, whereon they began to reign: beginning the Year the first Day of January, 1747.				The Length of each Reign.			The Years expired since each Reign began and ended.	
Names.	Born.	Began to Reign.	Y. M. D.	Beg.	End.			
William Conq.	1027	1066 October 14	20 10 26	681	660			
William Rufus	1057	1087 Septem.	12 10 24	660	647			
Henry I.	1058	1100 August	23 4 0	647	604			
Stephen	1105	1135 Decem.	1 18 10 24	604	593			
Henry II.	1134	1154 October 25	34 8 11	593	558			
Richard I.	1156	1189 July	6 9 9 0	558	548			
John	1166	1199 April	6 17 6 13	548	531			
Henry III.	1207	1216 October 19	56 1 0	531	479			
Edward I.	1239	1272 Novem.	16 34 7 21	475	440			
Edward II.	1284	1307 July	7 19 6 13	440	420			
Edward III.	1312	1327 January	20 50 5 1	420	370			
Richard II.	1366	1377 June	21 22 3 8	370	348			
Henry IV.	1367	1399 Septem.	29 13 5 21	348	334			
Henry V.	1389	1413 March	20 9 5 11	334	323			
Henry VI.	1421	1422 August	31 38 6 4	323	286			
Edward IV.	1442	1461 March	4 22 1 5	286	264			
Edward V.	1471	1483 April	9 0 2 13	264	264			
Richard III.	1443	1483 June	22 2 2 0	264	262			
Henry VII.	1457	1485 August	22 23 8 0	262	238			
Henry VIII.	1492	1509 April	22 37 9 6	238	200			
Edward VI.	1537	1547 January	28 6 5 8	200	194			
Mary I.	1516	1553 July	6 5 4 11	194	189			
Elizabeth	1533	1558 Novem.	17 44 4 7	189	144			
James I.	1566	1603 March	24 22 0 3	144	122			
Charles I.	1600	1625 March	27 23 10 3	122	98			
Charles II.	1630	1649 January	30 36 0 7	98	62			
James II.	1633	1685 February	6 4 0 7	62	58			
Mary II.	1662	1689 Feb.	13 5 10 15	58	33			
William III.	1650		13 13 0 23	58	45			
Anne	1665	1702 March	8 12 4 24	45	34			
George I.	1660	1714 August	1 12 10 10	33	20			
George II.	1683	1727 June	11	whom God preserve.				

A Compendious TABLE of INTEREST,
 shewing the Interest of any Sum of Money, from a Million
 to a Pound; for any Number of Days, at any Rate of
 Interest.

N ^o .	l.	s.	d.	q.	N ^o .	l.	s.	d.	q.
1000000	2739	14	6	0,99	1000	2	14	9	2,14
900000	2465	15	0	3,29	900	2	9	3	3,12
800000	2191	15	7	1,59	800	2	8	10	0,11
700000	1917	16	1	3,89	700	1	18	4	1,10
600000	1643	16	8	2,19	600	1	12	10	2,80
500000	1369	17	3	0,49	500	1	7	5	3,70
400000	1095	17	9	2,79	400	1	1	11	0,50
300000	821	18	4	1,09	300	0	16	5	1,40
200000	574	18	10	3,40	200	0	10	11	2,30
100000	273	19	5	1,70	100	0	5	5	3,10
90000	246	11	6	0,32	90	0	4	11	0,71
80000	219	3	6	0,96	80	0	4	4	2,41
70000	191	15	7	1,59	70	0	3	10	0,11
60000	164	7	8	0,22	60	0	3	3	1,81
50000	136	19	8	2,85	50	0	2	8	3,51
40000	109	11	9	1,48	40	0	2	2	1,21
30000	82	3	10	0,11	30	0	1	7	2,00
20000	54	15	10	2,74	20	0	1	1	0,60
10000	27	7	11	1,37	10	0	0	6	2,30
9000	24	13	1	3,23	9	0	0	5	3,67
8000	21	18	4	1,10	8	0	0	5	1,40
7000	19	3	6	2,96	7	0	0	4	2,41
6000	16	8	9	0,82	6	0	0	3	3,76
5000	13	13	11	2,58	5	0	0	3	1,15
4000	10	19	2	0,55	4	0	0	2	2,52
3000	8	4	4	2,41	3	0	0	1	3,80
2000	5	9	7	0,27	2	0	0	1	1,26
1000	2	14	9	2,14	1	0	0	0	2,63

R U L E.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two last Figures to the right Hand, and the rest you must find in the Table.

Example. What is the Interest of 100*l.* for 365 Days at 5 per Cent.

N^o. of Days 365

multiply by 100

Product 36500

multiply by 5 Rate p. Cent.

182500

Then in the Table

against 1000 is 2 14 9 2,14

800 2 3 10 0,11

20 0 1 1 0,60

5 0 0 3 1,15

Ans^r. 5 0 0 0,00

Of the Eclipses for the Year 1747. 49

WITHIN the Sphere of the Earth's Orbit will happen six Eclipses this Year. Four of the Sun, and Two of the Moon. They happen in the following Order. The first is of the Sun on *Thursday January 29.* about 3 in the Afternoon; yet invisible to us, tho' the Air should be so clear.

The second is of the Moon on *Saturday February 14.* about in the Morning, Visible. The Times whereof, as received from our ingenious Contributor Mr. *J. Elger*, are as follows.

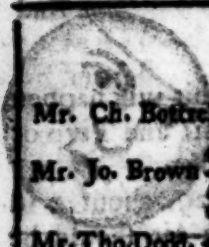
		Beg.	Immer.	Mid.	Emers.	End	Digits
Brent's Tab.	{ London	3 24 4	25 5 13	6 17 2	7 19 39		
	{ Kintbury	3 39 4	26 5 8	5 56 6	57 3		
Leadbetter's	{ London	3 4 4	44 53 5	42 6 42	26 11		
	{ Kintbury	2 59 3	59 4 48	5 37 6	37 5		

Mr. *Thomas Sparrow*, Mr. *Thomas Cowper*, and Mr. *William Hobbs* have favoured us with the Result of their Calculations the said Eclipse; for *Mansfield*, *Wellingborough*, and *Heath Oxfordshire* respectively, as below.

	Mansfield	Wellingborough	Heath	Time
Beginning Feb. 11.	3 12 2	3 21 42	3 14 25	
Begin. of Darkness	4 12 4	4 22 17	4 11 26	
Middle	4 58 28	5 10 27	4 58 19	
Ecliptic Opposition	4 59 15	5 11 15	4 59 6	
End of Darkness	5 45 20	5 58 37	5 45 12	
End of Eclipse	6 45 31	6 59 12	6 45 23	
Time Dark	1 33 16	1 36 20	1 33 46	
Whole Duration	3 33 29	3 37 30	3 34 8	
Digits	19 41 57	19 43	19 43	

N. B. Mr. *Cowper's* Calculation was from Brent's Tables.

We have also received an Account of the Times, Places &c. the said Eclipse, from several other of our ingenious Correspondents, as exhibited in the following Table.



	Beg.	Midd.	End	Dur.	Dig.
Mr. Ch. Bottrel { Bristol	3 22	5 3	6 43	3 23	19 4
{ Lizard	3 11	4 52	6 33		
Mr. Jo. Brown { Witton-le-Wear	2 40	4 29	6 18	3 38	20 13
{ London	2 46	4 35	6 24	3 38	20 13
Mr. Tho. Dodd { Hawkstone-Vin	3 12	4 52	6 35		
{ W. Chester-Yard	3 10	4 50	6 33	3 23	19 4
{ Dublin	2 54	4 34	6 17		
Mr. Ralph Hulfe, London	3 13	5 0	6 43	3 30	20 0
Mr. John Hollingworth, London	3 13	4 57	6 49	3 34	19 4
Th. Harbridge { Rowright-comes	3 0	4 48	6 36		
Feb. 23 Night { Virginia	10 18	11 56	13 54	3 36	20 4
{ London	3 5	4 53	6 42		
Mr. John James { Gloucester	2 56	4 44	6 33	3 37	20 6
{ Amsterdam	3 36	5 14	7 3		
Mr. Abraham Lord, Leicester	2 44	4 32	6 21	3 37	19 5
Mr. John Skay, Long-Compton	3 1	4 48	6 36	3 35	19 5
Mr. Dion. William's { London	3 32	5 14	6 55		
By Brent's Tab. on { Lands End	3 9	4 59	6 33	3 23	19 4
Mr. Machin's N ^s . { Selly	3 5	4 47	6 28		
Mr J. Walker { Brents { London	3 25	5 11	6 58		
{ Tab. { Kettering	3 22	5 8	6 55	3 33	19 4
{ Leadbetter's London	3 24	5 11	6 59	3 35	19 4

The third is of the Sun *Feb. 28*, at 10 Minutes past 5 in the Morning. Consequently invisible to the Inhabitants of this Isle; and where visible, but very small.

The fourth is also an invisible Eclipse of the Sun *July 26*, near 9 in the Morning.

The fifth is an Eclipse of the Moon *August 26*, near 9 in the Morning. Invisible to us by Reason of the Moon being below our Horizon at that Time; But in the more Western Parts of the World it will be Visible and Total.

The sixth is of the Sun *August 24*, near 9 in the Evening. But only Visible in the unknown Parts of the World.

There will likewise happen an Occultation of *Cor Leonis* by the Moon on the 12 of *March*; a Computation of which is here annexed from the *aforesaid Brent's Tables*, by our ingenious Correspondent *Mr. Tho. Cowper*.

		London	Wellington	End
1747	Beginning	8 33 28 8	29 51	
March 12	Middle	9 3 54 8	59 31	
at Night	Vis. Conjunct.	9 8 29 9	4 24	Bed
app.	End	9 34 24 9	29 14	
time	Duration	11 0 56 0	59 23	



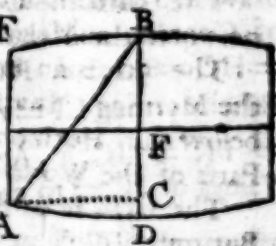
N. B. In computing the Moon's Place, I only used the Annual, Elliptic, and Variation Equations; according to Mr. Machin's Theory.

Mr. James Elgar also takes Notice that *Venus* is a Morning Star from Jan. 5. to Oct. 19. And then an Evening Star to the Year's end. He also favoured us with a Poem on Astronomy; and the Result of his Calculations of the Great Eclipse of the Sun, which will happen July 14, 1748. For London, Edinburgh, Dublin, Lisbon, Madrid, Paris and Vienna; all which, for want of Room, must be postpon'd till a more convenient Opportunity.

Answers to the MATHEMATICAL Questions 1746.

The 51 Question answered by Mr. JOHN TURNER of Hull.

Let $BD =$ Bung Diameter $= 50 = F$
 $AB = 60 = d$, $n = 1077, 15$,
 and $2x = AE$ the Head Diameter,
 then $2 AC$ or the Length is $= 2$
 $\sqrt{d^2 - b^2 - 2bx - x^2}$ and (per
 Ward's First Theorem in his Appendix)
 $8b^2 + 4x^2 \times 2\sqrt{d^2 - b^2 - 2bx - x^2}$



$= c$ the Cask's Content, which involved and putting $\frac{cn}{8} = p$,
 and $d^2 - b^2 = q$ will give $x^6 + 2bx^5 + \frac{q}{4}x^4 + 8b^3x^3$
 $+ 4b^4 - 4b^2q \cdot x^2 + 8b^5x = 4b^4q - p^2$. Now, as I
 take it, there is a Mistake in the Question, the Content
 being given too little for the other Dimensions: But if we
 suppose it to hold 490 Gallons, then x would be found $=$

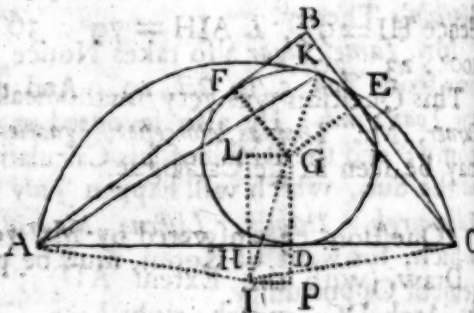
22. Questions answered in last Year's Diary.

14.7 Inches, the Head Diameter 29.4. And the Length 90 Inches.

Mr. Robert Robinson, by supposing the Cask's Content 4 Gallons, (and much the same Way of Reasoning) finds $x = 22.07629$ = half the Head Diameter, and the Length = 74.3995 Inches. We have also received very good Theorems for solving the same from Mr. Ch. Smith, Mr. John Todd, Mr. Rob. Pitches, Mr. Thomas Moss, and others.

Question 52 answered by Mr. JAMES TEREY Shipwright

Let $AC = 100 = b$,
 $GD = GE = GF =$
 $20 = r$, and $EC = DC$
 or $FA = DA = x$.
 Then $BC = r + x$, and
 $BA = b - x + r$ and
 (per 47. E. 1.) $AB^2 +$
 $BC^2 = AC^2$ i. e. $r^2 +$
 $2rx + x^2 + b^2 =$



$2bx + 2br + x^2 - 2rx + r^2 = b^2$. Whence $x = \frac{b}{2} \mp$

$\sqrt{\frac{1}{4}b^2 - r^2 - br} = 40 = DC$, or $= 60 = AD$. Therefore
 $AB = 80$, $BC = 60$. But to find the least Angle, let a
 Segment of a Circle AKC be described so as to pass thro' the
 Angular Points A and C and touch the given Circle as in K ,
 draw IK thro' the Centers I and G ; then will K be the Point
 of Contact, and the Angle AKC the least possible. Put AH
 $= HC = 50 = d$, $HD = LG = 10 = a$, $GD = 20 = r$, and
 $HI = x$; then $LI = r + x$, and $\sqrt{r^2 + 2rx + x^2 + a^2} + r$
 $= IK = IC$. Again $\sqrt{d^2 + x^2} = IC$: Put these two
 Values of $IC =$ to each other, and by proper Reduction we
 have $x = \frac{d^2 - a^2 - 4r^2}{4rd - 4r^2} = 9\frac{1}{2}$, and per Trigon. the $\angle$

$AIH = 79^\circ 36' 40''$ and its Comp^t. to 180° is $100^\circ : 23' : 20''$
 $= \angle AKC$ sought.

Mr. ROB. ROBINSON's Solution to the same.

Upon AC describe a Circular Segment to touch the given
 inscribed Circle, and to the Point of Contact draw the Lines

A K

K KC which will form the L required, Put $DG = 20 = 2a$,
 $H = 50 = n$, $IP = HD = y$. Then $AB = 2a + n + y$,
 and $BC = 2a + n - y$; And (per 47. E. 1.) putting $2a + n = d$
 we have $4n^2 = d + y^2 + d - y^2 \therefore y = \sqrt{2n^2 - d} = 10$.
 again make $IK = a + x$, and $IG = x - a$, then will $DP =$
 $x - a^2 - y^2 - 2a$; but $AI^2 = AH^2 = HI^2$; that is
 $+a^2 - n^2 = x - a^2 - y^2 + 4a^2 - 4a\sqrt{x - a^2 - y^2}$
 $-x = \sqrt{x - a^2 - y^2}$, and $x = \frac{2n^2 - a^2}{2n + 2a} = 40 \frac{5}{6}$

Hence $HI = 9 \frac{1}{2}$, $L AIH = 79^\circ : 36' : 40'' \therefore L AKC =$
 $100^\circ : 23' : 20''$.

This Question was very methodically solved by Mr. *John*
Turner, Mr. *Thomas Worcester*, *Ignoties*, and several others, as
 may be seen in the Catalogue.

Question 53 answered by Mr. JOSEPH PILGRIM.

Draw (with the Extent AD) B
 the Arch DG, and the right Line
 AHE infinitely near AD; then
 the Δ s ABD, and DHE are si-
 milar.



Now the Sum of the Lines AD,
 DC must be such as can be travel-
 ed in the shortest Time possible at
 the Rate of 3 Miles per Hour in AD, and 5 in DC. Hence
 is evident the Fluxion HE, of the Secant AD, must be to
 the Fluxion DE, of the Tangent BD, as 3 to 5; but when
 $HE = 3$, and $DE = 5$; DH will $= 4$ (per 47. E. 1.) There-
 fore as $DH (4) : HE (3) :: AB (60) : BD (45)$; and DH
 $(4) : DE (5) :: AB (60) : AD (75)$ Miles, therefore $BC =$
 $BD = 35$ Miles; and $5 : 1 :: 35 : 7$ Hours; also $3 : 1 ::$
 $75 : 25$ Hours. Consequently the whole shortest Time
 will be 32 Hours.

Mr. THOMAS ATKINSON's Solution to the same.

Put $BC = a = 80$, $AB = b = 60$, and $AD = y$; then
 $BD = \sqrt{y^2 - b^2}$ $DC = a - \sqrt{y^2 - b^2}$; and the Time of the
 whole Journey will be expressed by $\frac{a - \sqrt{y^2 - b^2}}{5} + \frac{y}{3}$,
 Flux'd

24. Questions answered in last Year's Diary.

Flux'd $\frac{-2y}{5\sqrt{y^2-6}} + \frac{y}{3} = 0$. Therefore $y = \frac{5b}{4} = 75$.
Hence $DC = 35$, and he will perform his whole Journey in 32 Hours.

The same answered by Mr. WILLIAM JEPSON.

Let $BC = a = 80$ Miles, $AB = 60 = b$, $BD = x$; then will $a - x = CD$ and (per 47. E. 1.) $\sqrt{b^2 + x^2} = AD$:
 $\frac{a-x}{5} + \frac{\sqrt{b^2+x^2}}{3}$ is a Min. per. Question, which put into Fluxions and properly reduced gives $x = 45$. Hence $AD = 75$, and the Time of performing the whole Journey = 32 Hours.

The same answered by Mr. JOHN WAIN.

As the Distances AB and BC are known, we can by assuming one unknown Distance have Expressions for all the rest; for (per 47. E. 1.) $AB^2 + BD^2 = AD^2$, and per Question $BC - BD = AD$:
 $\frac{AB^2 + BD^2}{3} = \frac{(BC - BD)^2}{5}$ = Time in going from A to D ; also $\frac{BD}{5}$ = Time in travelling from D to C , the Sum of which is a Minimum :
 $\therefore \frac{BD \times BD}{3 \times AB^2 + BD^2} - \frac{BD}{5} = 0$. Reduced $BD = \frac{3}{4} AB = 45$:
 $\therefore AD = 75$, and the Time required 32 Hours.

This Question was solved, after the very same Method, by Mr. W. Kingston of Bath.

We might exhibit a great many more Answers to this Question as received from our ingenious Correspondents; but as it would be a Repetition of much the same thing, we have chose only to insert their Names. (viz.) Mr. John Ash, Mr. Tho. Worcester, Mr. Geo. Stapeley, Mr. Tho. Comper, Mr. Rob. Robinson, Mr. Ch. Smith, Mr. Rob. Williams, Mr. Edward Cross, Mr. John Todd, Mr. Abr. Lord, Mr. W. Bevil, Mr. Tho. Dodd, Mr. Am. Baker, Mr. Geo. Marjon, Mr. Sam. Bamfield, Mr. John Turner, Mr. Tho. Moss, Mr. Tho. Hare, Mr. Tho. Garrard; and several others.

Quest.

Question 54 answered by Mr. JOHN WAIN.

Let a Circle be described (in which tis plain if the required triangle be inscribed; the Point S, (i. e. the meeting of the three given right Lines) will be in the Center thereof) and draw the Diameter AM, then divide the Semi-periphery CDM into three such Parts, that the Chords AC, CD and DM be in the same Ratio as the three given right Lines;

draw the Diameter CV, and join AV, and DV, in which draw SE, SF and SP parallel to CD, CA, and MD, and they will represent the three given right Lines. Having from the Data $VF = FA$, and $VF = 31. E. 3.$ the Triangle AC a right angled one; thence follows that $AC = 2 FS$; and in like man-



ner $CD = 2 SE$, and $DM = 2 SP$: Whence the Question is reduced to this; (*viz.*) Given the three Subtenses of three Arcs completing a Semi-circle; to find the Diameter of that circle? This is solved at Page 332 of *Ward's Introduction to the Arithmetick*; where if a be put $= AM$, $b = AC$, $c = CD$ and $d = DM$, it will be $a^3 - b^2a - c^2a - d^2a = 2bcd$. From which a may be exterminated, and thence AD had $= 8,7548$, $VD = 62,6108$ and $VA = 65,69708$. Also the content of the whole Meadow 167 Acres, 1 Rood, and 10 perches. Parts, Greatest 59,021, 2^d 55,4826, and least 2,8112 Acres. Q. E. I.

The same answered by Mr. JOHN TODD.

Tis evident (*per* 5. E. 4.) that the Point of Intersection is the Center of the circumscribing Circle. Put $a = SF$, $b = SE$, $c = SP$ and $x = SA = SV = SD$: then $\sqrt{x^2 - b^2} = ED$ and $\sqrt{x^2 - c^2} = PD$: Then having the Sines and Cosines of the Arcs DI, and DL; I find the Cosine of

$$\text{their Sum} = \frac{\sqrt{x^2 - b^2} \times \sqrt{x^2 - c^2} - bc}{x} = a = \text{Cosine of } VH: \text{ And}$$

26 Questions answered in last Year's Diary.

And by Reduction we get this Equation $x^3 - 990x = 11340$, sol'd $x = 36,111$ } $x = 2$ ad

In Numbers $x^3 - 990x = 11340$, sol'd $x = 36,111$ }
Hence the Area of the whole Meadow $AVD = 1673,120$
of the Parts $ESPD = 590,203$; $FSPA = 554,818$; EVP
 $= 528,105$: The Sides $AD = 58,554$; $AV = 65,696$
and $DV = 62,610$.

Mr. W. BEVEL solves it thus.

Let $SF = 15 = a$, $SE = 18 = b$, $SP = 21 = c$, and $SA =$
 $SV = SD = x$: Then (per 47. E. 1.) $2\sqrt{x^2 - a^2} = AV$,
 $2\sqrt{x^2 - b^2} = DV$, and $2\sqrt{x^2 - c^2} = AD$, and (per Sim. Δ)
 $\sqrt{x^2 - b^2} = PE$. Also (per this Theo. (viz.) $AF \times SP +$
 $\times SF = AS \times PF$) $c\sqrt{x^2 - a^2} + a\sqrt{x^2 - c^2} = x\sqrt{x^2 - b^2}$.

This Equation freed from Surds, and substituting for known
Quantities, we have $x^3 - 990x = 11340$, solved $x = 36,111$;
Hence the Sides are $AD = 58,7546$, $DV = 62,6108$,
and $AV = 65,696$; the Areas of each Part are $492,72$;
 5634972 ; and $616,9233$: Also the whole Area =
 $1673,1405 = 167$ Acr. 1 Rood 10 Perch. W. W. R.

The same answered by Mr. RICH. GIBBONS of *Torness*.

Given the three Perpendiculars $FS = 15$, $ES = 18$, and
 $PS = 21$, also $SA = SV = SD$; whence it is evident that
three Nat. Sines in the same Ratio of the three given Per-
pendiculars. (viz.) 5, 6 and 7 making a Quadrant will give
all the Angles, which I think is best done by Mr. Heath's
Rule for finding the greatest Areas. Thus, 'tis plain the Angle
 $FAS = \angle FVS$ is between 24 and 25 Degrees; wherefore I
suppose it $= 24^\circ 30'$; which I find by Trial makes the Sum
of the Angles too little by $9' 56''$, which I call the first Er-
ror. And by making it $3'$ more (viz.) $24^\circ 33'$, it makes the
Sum of the Angles too much by $1' 31''$ for a second Error. Then,
as the Sum of the Errors $11' 27''$ (being unlike) is to the Dif-
ference of the Suppositions :: so is either Error (viz.) $9' 56''$,
or $1' 31''$ to a fourth Arch, which added to, or subtracted
from its proper Supposition, gives the lesser Angle $= 24^\circ 32'$
 $36'' = \angle FAS = FVS$; Hence the $\angle EVS = \angle EDS =$
 $29^\circ 53' 53''$, and the $\angle PAS = \angle PDS = 55^\circ 33' 31''$.

Now

whose Fluent is $= \frac{8}{27} \times 1 + \frac{9 \times 1^{\frac{3}{2}}}{4} = \frac{8}{27} = 6; ($

50,7786) which Equation reduced gives $x = \frac{4}{9} \times 1 + \frac{27 \times 1^{\frac{3}{2}}}{8}$

$- 1 = 40 = AH = DB$: Then from the Equation is found $y = 30$ (fere) $= BH = DA$ and (per. 47. E. 1.) AB will be found $= 50$ (fere) Now the Area of the space AHB is

$= \frac{2xy}{5}$; or ADB is $A = \frac{3xy}{5} = 720$, from which take the

Area of the right angled Triangle $ADB = 600$, there will remain $120 =$ Area of the Fiddlestick space AB is A , which being tripled (is $= 360$) and taken from the Area of the Equilateral Triangle $ABC = 1082,525$, leaves $722,525$ Chaine $=$ the Content of the Piece of Land. Which was required.

Mr. JOHN TURNER's Solution to the same.

Put $An = x$, $as = y$, $c = ,01402$, $b = A \pi B = 50,7786$

the length of the Curve, $\sqrt{x^2 + y^2}$ the Fluxion of any Curve length, and $y \dot{x} =$ the Fluxion of its Area. Then (per Quæ)

$$\dot{y}^2 = cx^3; \dot{y} = \frac{3cx^2 \dot{x}}{2y}; \text{ and } \dot{y}^2 = \frac{9c^2 x^4 \dot{x}^2}{4y^2} = \frac{9}{4} cxx^3; (\text{and})$$

$$\text{making } f = \frac{9}{4} c = ,031545) \sqrt{x^2 + y^2} = \sqrt{x^2 + fx^3}$$

$= x\sqrt{1 + fx^2}$; the Fluent of which when corrected is

$$x\sqrt{1 + fx^2} = \frac{2}{3f} (\text{and when } x \text{ becomes } = \text{to } AH) = b: \text{ then}$$

$$1 + fx = 2,2624; \text{ and } x = \frac{1.2624}{0,31545} = 40,02 = AH$$

and $y = 29,978 = BH$.

Secondly for the Area. By the Nature of the Curve $zyy = 3cx^2x$ and $x = \frac{2yy}{3cx^2} \therefore yx = \frac{2y^2}{3cx^2} = \frac{2}{3} y \sqrt{\frac{y}{c}}$ whose

Fluent (by Page 24 of the Appendix to Stone's Fluxions)

$$\frac{2}{5} \frac{y^{\frac{5}{2}}}{c} = \frac{2}{5} y \sqrt{\frac{y^2}{c}} = \frac{2}{5} xy. \text{ So the Area } B \pi AB = \frac{1}{10} x y$$

and thrice that Sum $= 359,916$ subtracted from the Area of the Equilateral Triangle $ABC = 1082,532$, leaves the Area comprehended by the three Curves $= 722,616$.

N.B. $AB = BC = CA = 50$ *quasi proximo*.

The same answered by Mr. THO. GARRARD.

Put $x = Ax$, $y = ns$, and $\frac{642}{9} = a$; Then by the Equation

of the Curve $ay^3 = x^3$. Whence we get $\sqrt{x^2 + y^2} = x$

$\sqrt{9x^2 + 4a^2}$ for the Fluxion of the Curve; whose Fluent

corrected is $\frac{8a}{27} \times \frac{4a + 9x^{\frac{1}{3}}}{4a} - \frac{8a}{27} = c = 50,7786$ the

length of the Curve. Whence by Reduction we have $x = \frac{4a}{27c + 8a^{\frac{2}{3}}}$

$\frac{4a}{9} = AH = 40,0165$; and $y = \frac{x^{\frac{3}{2}}}{a^{\frac{1}{2}}} = BH$

$= 29,9716$. Also (per. 47. E. 1.) $AB = \sqrt{x^2 + y^2} =$

$9,9962 = AC = BC$ which call s , then will $\sqrt{\frac{3}{16}s^4} = 1082,$

$68 =$ the Area of the Equilateral Triangle ABC . Now $y =$

$\frac{x^{\frac{3}{2}}}{a^{\frac{1}{2}}}$, Consequently $y \dot{x} = \frac{xx^{\frac{3}{2}}}{a^{\frac{1}{2}}}$ = the Fluxion of the Area of

the Semi-parabola $A\beta BH$; whose Fluent is $\frac{2x^{\frac{5}{2}}}{5a^{\frac{1}{2}}} = \frac{2xy}{5}$

Hence we have the Area of $A\beta BA = \frac{xy}{10}$ which tripled is

$\frac{3xy}{10} = 359,809$. This subtracted from $1082,368$ leaves

the Area of the Field $= 722,559$.

This Question was also very ingeniously solved by Mr. John Gold, Mr. Abr. Lord, Mr. Ant. Baker, Mr. Rob. Robinson and others. But the Room we are here confined to will not admit their Insertion at large: Therefore we refer you to the Catalogue.

Question 56 answer'd by Mr. ABR. LORD.

For the Sine of the Sun's Altitude at 4 put a , for the Co-

sine

90 Questions answered in last Year's Diary.

fine of the Arc from Noon at 4 put b , and for the Cosine of the Arc from Noon at Sun-set, put c ; then we shall have $\frac{a-b}{b+c}$

$+a = 74433$ = the Sine of the Sun's Meridian Altitude $= 48^\circ 6' 6''$, and $\frac{2a}{b+c} - \frac{a+ba}{b+c} - a = 644397$ the Sine

of its Depression at Midnight $= 40^\circ 7' 13''$. Hence the Lat. is $45^\circ 53' 37''$; and the Declin. $3^\circ 59' 38''$. Q. E. D.

The same answered by Mr. W. KINGSTON.

Let a and e represent Sine and Cos. of the Latitude; x and y those of the Declin. n = Sine of $23^\circ 23' 40''$; m = Cosine of the Hour from Noon $= 60^\circ$; d = time of Sun-setting, or Sine of $4^\circ 7' \frac{1}{2}$. Then from Spherics arise these two Equations $ax + mey = n$, and $ax = dey$; for ax write dey , and it

will be $ey = \frac{n}{d+m}$; this wrote for ey in either of the preceding Equations, gives $\frac{dn}{d+m} = ax$, $\therefore ey - ax =$

$\frac{n-dm}{d+m} = 6443022$ = Cosine of $49^\circ 53' 12''$ = the Sum

and $ey + ax = \frac{n+dm}{d+m} = 7441793$ = Cosine of $41^\circ 54'$

$40''$ = the Difference between the Lat. and Declin. Hence the Lat. is $= 45^\circ 53' 56''$; and Declin. $= 3^\circ 59' 16''$; which answers to March 19.

Mr. CHARLES SMITH solves it thus.

Put d = Sine of the Sun's Alt. at 4 o' Clock, c = Cosine of the Hour from Noon, s = Sine of the Ascensional Diff. and let x and y = Sine and Cosine of Lat., u and z = Sine and Cosine of Declin. Then $1 : \frac{x}{y} :: \frac{u}{z} : \frac{ux}{yz} = s : \therefore ux$

$= syz$ and (by a Theorem in the late Mr. Thacker's Miscel.) zy

$+ux = d$; Th. $ux = d - cxy = szy$, and $zy = \frac{d}{s+c} =$

Rect-Angle of the Cosines of Lat. and Declin.; and by Sub. for zy its Value $\left(\frac{ux}{s}\right)$ we have $ux = \frac{s \cdot d}{s+c} =$ Rectangle of

Sines. Hence $\frac{d + sd}{1 + c} = 7421788 =$ Cosine of

$54^\circ 41' =$ Diff. of Lat. and Declination; and $\frac{d - sd}{1 + c} =$

$443018 =$ Cosine of $49^\circ 53' 56'' =$ their Sum. Whence
 Lat. is $45^\circ 53' 56''$, and Declin. $3^\circ 59' 16''$. Answering to
 March 20.

We have also received very curious Solutions to this Quest.
 from Mr. Ed. Cross, Mr. J. A. Elgar, Mr. John Todd, Mr.
 John Turner, Mr. John Ash, Mr. Tho. Atkinson, Mr. Rob. Ro-
 nson, and others; as may be seen in the Catalogue.

Question 57 answered by Mr. EDWARD CROSS.

Put $d =$ Sine of the Sun's Declin.; ($= 23^\circ 29'$) and $q =$ Sine
 of Cosine of half Diff. of Altitudes, ($= 7^\circ 23'$) and x and $y =$
 Sine and Cosine of half Sum of the same; Then $sy + qx$ and
 $-sy =$ Sines of greater and lesser Altitudes respectively:

and (per Spherics) as $sy + qx : 1 :: d : \frac{d}{sy + qx} =$ Sine Lat.

and $d : 1 :: qx - sy : \frac{qx - sy}{d} =$ Sine of Latitude, consequently

$\frac{d}{1 + sy} = \frac{qx - sy}{d}$, Th. $d^2 = q^2 x^2 - sy^2$: put $(1 - x^2)$ for

sy^2 , then $s^2 + d^2 = x^2$, which multiplied by 2 gives $2x^2 =$
 $1 + 2d^2 = .5506044$ the versed Sine of $49^\circ 30' =$ the
 Sum of the Altitudes. Th. the Altitudes are $32^\circ 8'$; and
 $16^\circ 22'$; also the Lat. $48^\circ 31'$.

The same answer'd by Mr. J. A. ELGAR.

Put $x =$ Sine of $23^\circ 29' =$ Sun's Declin. on 11th of
 June; and $d =$ Cosine $14^\circ 46' =$ the Diff. of Altitudes:
 then will $d - 2x^2 =$ Cos. of the Sum of the Altitudes.
 Hence the Sun's Alt. at 6 is $= 17^\circ 22' 5''$; and when due East
 $10^\circ 8' 5''$. Consequently the Place's Lat. is $48^\circ 30' 49''$. (See p.
 8 and 151 of *Thacker's Miscel.* V. 1.)

Mr. Tho. COMPER (by a Process like that above by Mr. Ed.
 Cross) brings out $2x^2 = 2s^2 + 2d^2$; and thence the following
 Theorem.

The Sum of the versed Sines of twice the Sun's Declination,
 and Diff. between the Alt. at 6 and when due East, is equal
 to the versed Sine of the Sum of those Altitudes. It

32 Questions answered in last Year's Diary.

It was also very ingeniously solved by Mr. Tho. Moss, Mr. Ch. Smith, Mr. John Todd, Mr. Ab. Lord, Mr. John Turner, Mr. Geo. Stapley, Mr. Tho. Atkinson; and several others.

Question 58 answered by Mr. ROB. WILLIAMS of Exon.

Given the Area of the Triangle $ABC = 240$ Poles $= A$; and the Area of the inscribed Square $= 100 = d^2$, one of whose Angles is the right Angle of the given Triangle. Let x and $y = \text{Sine and Cos. of the Angle}$

DAE , Rad. $= 1$: then $x : d :: y \frac{dy}{x} = AE$;

but $d \frac{y}{x} + d = AB$: The Triangles ADE ,

and DCF are similar: Th. $y : d :: x : \frac{dx}{y} = CF$;

and $d \frac{x}{y} + d = CB$; and by a known Rule $AB \times CB =$

$d^2 \frac{x}{y} + d^2 \frac{y}{x} + 2d^2 = 2A$. Hence by Transposition and

Reduction $xy = \frac{d^2}{2A - 2d^2}$ which multiplied by 2 gives

$2xy = \frac{d^2}{A - d^2}$; from which Equation we have the follow-

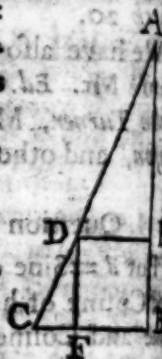
ing Analogy. As the Diff. of the Areas, is to Radius; so is the Area of the inscribed Square, to the Sine of double the lesser acute Angle $= 714857$: $\therefore x = \text{Sine } 22^\circ 47' 35''$ and $y = \text{Sine } 67^\circ 12' 25''$. Th. (per Trig.) the Sides are $AB = 33,7981$, $AC = 36,6607$, and $BC = 14,202017$. Q. E. D.

The same answered by Mr. THO. MOSS.

Put $x = AE$, $z = CE$, $A = \text{Area of the Triangle } ABC$ and $b = DE = DF$ (the Side of the Square.) Then (per sim. Δ) $x : b :: b : z$: $\therefore xz = b^2$. Again $AB \times BC = xz + bx + bz + b^2 = 2A$, $\therefore xz + bx + bz = 2A - b^2$, from which subtract the first Equation and it will be $bx + bz = 2A - 2b^2$.

Th. $x + z = \frac{2A - 2b^2}{b}$. Then having the Sum and Re-

angle of two Numbers (or Sides of a right angled Triangle) given; they may easily be determined separately.



The same answered by Mr. JOHN TOWN.

Let $A = 240$ Perches = the Area of the Triangle, $b = 560$ the Side of the inscribed Square, $x + y = AB$, and $x - y = AC$ then $x^2 - y^2 = 2A$, and $x + y : x - y :: x + y - b : b$. Hence

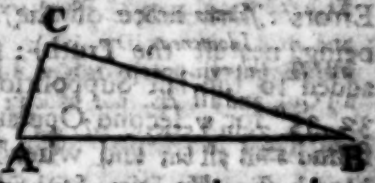
$2bx = x^2 - y^2 = 2A$, and $x = \frac{2A}{2b} = \frac{A}{b} = 24$. Consequently

$AC = 36.67272$, $AB = 35.8$, and $BC = 14.202617$. Q. E. I.

Mr. John Ash, Mr. John Todd, Mr. Ch. Smith, Mr. Ant. Baker, Dion. Williams, Mr. John White, and others, have very ingeniously solved this Question.

Question 59 answered by Mr. ROB. ROBINSON.

Let $x = AC$, $y = BC$, and $z = AB$, then will $xy = 16800 =$
 $\frac{z + y + z}{2} = 2x = 560$,
 and $x \times x = x \times x - y \times y = z$
 = Square of the Area = A



$x \times x - y^2 + 2x^2 z - mx - 4x^2$; Flux'd is $2x^2 z - mx -$
 $242x = 0 : x = \frac{m}{24} = AB = 250$, and Area = $\frac{m}{2} =$

8400. Hence the Δ is right angled at C when the Area is a Max.

The same answered by Mr. JOHN ASH.

Forasmuch as the Area of any plain Triangle is equal to half the Rectangle of any two of its Sides, into the Sine of their included Angle; Ergo, the required Area (it being a Maximum, and in that Case the included Angle is equal 90°) is half the given Rectangle = 8400.

Mr. JOHN TOWN'S Solution to the same.

Put $a = 16800$, $b = 560$, $2x =$ Sum, and $2y =$ Diff. Sides. Then $4x^2 - 4y^2 = 4a^2$, $\therefore 4y^2 = 4x^2 - 4a$, and $b - 2x =$ Base. Hence $\frac{1}{2} \sqrt{4x^2 - 4a^2} = \frac{1}{2} \sqrt{4x^2 - 4a^2} =$ Area which must be a Maximum. Th. Flux'd and reduced will be $2x = \frac{b}{2} + \frac{a}{b} = 310$. Hence the Sides are 70 and 240; and the Base 250; also the Area = 8400.

This Question was truly and ingeniously solved by Mr. Rob. Williams, Mr. James Terry, Mr. Rob. Pitcher, Mr. W. Bevil, Mr. Ant. Baker, Mr. William Kingston, Mr. John Turner, Mr. Mr. Lord, Mr. John Wain, and Mr. W. Jepson, all agreeing with the Proposer's own Solution.

34 Questions answered in last Year's Diary.

Question 60 answered by Mr. RICH. GIBBONS.

By a Trial or two, I find the Declination between 18 and 19 Degrees (which is near enough for my present Purpose) wherefore I suppose it the latter (*viz.*) 19° . Then as the Cos. Azimuth at fix : Cos. Declin. :: Rad. : Cos. Alt. at fix $= 15^{\circ} 26''$ — And as the Sine of the Alt. at fix : Sine Declin. :: Sine Declin. : Sine Alt. when East $= 23^{\circ} 8'$. Here the Diff. of the Altitudes is $7^{\circ} 42'$, too little by 18, which I call the first Error. And by making the Declination $30'$ less (*viz.*) $18^{\circ} 30'$, and proceeding as before, we get the Alt. at fix $14^{\circ} 56' 50''$, and when East $22^{\circ} 58' 30''$, too much by $1' 40''$ for a second Error; then as the Sum of the Errors : Difference of the Suppositions :: the last Error (as being nearest the Truth) : a fourth Arc $= 2' 35''$; which, added to the last Supposition, makes the Declination $= 18^{\circ} 32' 35''$ for a second Operation; by which the Alt. at fix is found $= 15^{\circ} 0'$, and when East, $23^{\circ} 0'$ the Lat. $54^{\circ} 28' 30'$ North, and the Day of Observation May 2.

If I had at first supposed the Declination $= 18^{\circ}$, and near $18^{\circ} 30'$; a second Operation worked through to prepare for a third, would have found the Answer as above. Which (I think) is a further Improvement of Mr. Heath's Rule; and may be found of good Use in *Spherics*, as well as plain *Trigonometry*, since the Sine and its Arc, when very small, are nearly equal.

The same answered by Mr. THO. COWPER.

Let $s =$ Sine and $b =$ Cosine of the Sun's Azimuth at fix $= 11^{\circ} 1' 40''$; $s =$ Sine and $c =$ Cosine of $8^{\circ} =$ the Diff. of Sun's Altitudes; and $x =$ Sine and $y =$ Cosine of Sun's Alt. at 6. Then $cx + y =$ the Sine of the ortive Alt. and (*per Trig.*) $1 : y :: b : by =$ Sine Comp^t of Sun's Declin. the Sine where-

of will be $\sqrt{1 - b^2 y^2}$; and $\sqrt{1 - b^2 y^2} : 1 :: x : \sqrt{1 - b^2 y^2}$

$=$ Sine of Lat. also $\sqrt{1 - b^2 y^2} : 1 :: \sqrt{1 - b^2 y^2} : \frac{1 - b^2 y^2}{x} =$

Sine of Sun's Altitude when due East or ortive Altitude, $\therefore cx + y = \frac{1 - b^2 y^2}{x}$, and $cx^2 + yx + b^2 y^2 = 1 = x^2 + y^2$; and dividing all by xy , and putting s for $\frac{x}{y}$, and $\frac{1}{s}$ for $\frac{y}{x}$ it will

be $s + \frac{b^2}{s} + 1 = s + \frac{1}{s}$; or $s^2 - s + 1 = 1 - b^2$, but

because $\sqrt{1 - b^2}$, and $\sqrt{1 - c^2}$ = the versed Sine of the
Diff. of Altitudes; $\frac{a^2}{b^2} = \frac{c^2}{d^2}$ which reduced gives

$$a = \frac{b \sqrt{c^2 - d^2}}{d} = 2679333 = \text{Tangent } 14^\circ 39' 57''$$

the Sun's Alt. at 6 o' Clock: Whence the Lat. is $54^\circ 28' 33''$
And Sun's Declin. $18^\circ 32' 29''$, agreeing to the 2^d of May.

We received from Mr. *abr. Lord* a very accurate and concise
Solution to this *Quest.* much like that before of Mr. *Theo.*
Compe's, which, for Want of Room, we are oblig'd to omit.
It was also very ingeniously solv'd by Mr. *Ch. Smith*, Mr. *Ed-*
ward Cross, Mr. *James Elgar*, Mr. *John Todd*, Mr. *J. Turner*,
Mr. *T. Atkinson*, Mr. *Thomas Worcester*, Mr. *T. Mesi*, and many
others. But as the narrow Limits we are here confined to will
not allow Room to insert near the Number of Solutions we
receive, we hope our ingenious *Contributors* will generously
excuse us; since it is our utmost Care (with regard to the Ac-
curacy and Conciseness of the Solutions) to oblige as many of
them as possible.

The PARADOX answered by Mr. *Sam. Hammond* the Proposer.

Two Cousin-Germans marry each other and beget A, also
a Brother or Sister to one of the said Cousin-Germans marries
and hath a Child B, which is both First and Second Cousin to
A; now A and B being of a different Sex, marry different
Persons, by whom A and B have each a Child of their own
Sex, C and D; (who being both second and third Cousins)
marry each other; A and B becoming single, marry each
other also; which two Marriages between AB and CD, as
they stood related to each other, fulfil the Paradox.

Answers to the ENIGMAS in last Year's Diary.

I. A FRANK'D-LETTER.

VI. A WOMAN'S-BUSK.

II. A PEN.

VII. A MAN'S BEARD.

III. A DREAM.

VIII. A FISH-HOOK.

IV. LOVE.

IX. A SHOEMAKER'S LAST.

V. ACE OF TRUMPS.

ENIGMA's answer'd, *B—ms—d* advis'd, } by *Jabbarwol*,
And *Gloe* (perhaps) anatomiz'd.

Awake, dull Muse and PEN, nor tardy seem,
Rouse *B—ms—d* out of his delusive Dream.

2.

3.

No

No more to haughty *Ch* chinge and bow,
 Her BUSK lies nearer to her Heart than thou;
 Perhaps she charms while *he* does dance or sing!
 But mask'd like FISH-HOOK hides the biting Sting!
 FRANK'S LETTERS bring false Hopes of sweet Embraces
 Love conquers Kings! and so does little ACES,
 Strange! that these Objects of our fond Regard,
 Shou'd prove at LAST e'en rougher than our BEARD.

All the ENIGMA'S answer'd by MR. SAM. HAMMOND.

A FRANKED-LETTER to my LOVE

I sent not DREAMING she

Wou'd ever in my Absence prove

Perfidious to me.

I carv'd her BUSK with BEARDED HOOK

I caught her dainty Fish;

Her Fan I lost with Pleasure took,

And mended to her Wish.

But notwithstanding at the LAST

She acts a jilting Part,

And, for the Sake of Gold, has cast

My Image from her Heart.

The Letter tore her Lover's Face

She burnt, (and with a Sneer)

Cry'd, *Truth*, I shou'd not care an ACE,

If the Author on't was here.

I'll care for her as little too,

Since by this Trick, I find

The ancient Saying very true;

Unseen, soon out of Mind.

Answer'd by Captain BUSTLE.

Let whining LOVERS doat and DREAM

Of Joys in *Celia's* Arms;

Her Fan, lac'd *SHOES or BUSK their Theme,

With ——— your enslaving Charms."

As Fishes on the BEARDED HOOK

Held captive at her Will;

Depending on her Smile or Look,

To save 'em or to kill.

The Dice let Gamblers still adore

And the TRIUMPHANT CARD

Dame Fortune, Hark! Hand, implore

Her Suppliants to regard.

These Things (so trifling) I despise,

And treat with just Disdain;

My *Busk*, my *PEN* and *PAPER* prize,

A learned Friend to gain.

Answered by DON QUIXOTE

A *Busk*, a *Letter* and a *Dream*;

Is *Hulse's*, *Obapple's*, *Bamfield's* Theme;

And *Hammond* next attempts to prove

The mighty Pow'r and Force of *Love*;

Hall shews his Skill upon a *CARD*,

Which justly claims our chief Regard.

And, that my *PEN* may solve all true,

A *LAST* and *FISH-HOOK* add thereto;

But if these Lines don't bring the Truth,

Pray, Sirs, excuse a *Beardless Youth*.

All the *ÆNIGMAS* answered by Mr. JA. HALL.

As a Key to each Riddle I send you this *Letter*,

Tho' bad, it may serve you instead of a better: [*GLORY*: 5. 2.

Here's the *GAMESTER'S DELIGHT*, and the *SCRIVENER'S*

And I thought I smelt something of *Love* in the Story,

Here's a *Busk* for the Ladies, a *BEARD* for the Youth,

A *FISH-HOOK*, a *DREAM*, and a *LAST* for your Shoes. 8. 3. 9.

An Answer to the *ÆNIGMA's* in a short Dissertation on

MAN; by Mr. SAM. BAMFIELD.

The anxious *Life* of vain, compounded *Mas*
Fleets like a *DREAM* — his Time's decreed a *Span*:

Full oft deceiv'd — like sporting *Fish* betray'd;

Easily Hook'd when treacherous *Bait's* display'd.

Such tempting Objects always round him stand,

They vigorously attract, *Eye*, *Tongue*, and *Hand*:

Vice, *Pleasure*, *CARDS* or *Dice* employ the Youth

More than bright *Learning*, *Reason*, *Wis* or *Truth*!

E'en they with hoary *BEARDS* do thus appear,

As well as *Youthful Clowns* (that *Buskings* wear)

But first or *LAST* Beauty will shew her Sway,

And *Strephon* then *Love's* Dictates must obey.

Hence wounded deep — tho' trembling *PEN* must speak

A *Letter* then's convey'd his Heart may'nt break;

Applauds each Grace — thinks *Happiness* is there —

But, when enjoy'd, 'tis thought some otherwhere:

Then that's with Eagerness pursu'd — but gain'd — must still be paid
Soon fails — no lasting Bliss belows obtain'd.

'Tis thus with all — the *Learned, Rich, and Brave*;

The greatest *Monarch* and the meanest *Slave*.

Answered by Mr. CHR. MASON.

A PEN and a LETTER when LOVE is the Theme; 2. 1. 4.
Will solve three *Enigmas* if rightly I DREAM: 3.
And the ACE o'th' Trumps, if you play at Loe; 5.
A BUSK, BEARD, and FISH-HOOK; with a LAST for a Shoe;
Will solve all the rest, if my Notions are true. [6. 7. 8. 9.]

Answered by Mr. WILLIAM MORRIS.

Perusing your *Riddles* LOVE's Thoughts to employ,
A FISH-HOOK, and LETTER, at LAST did descry:
A PEN, BUSK, and DREAM, hit three more to an ACE,
As plain as my BEARD or the Nose on your Face.

Answer'd by Mr. W. JEPSON, address'd to Mr. *Bamfield's* *Chloe*.

Chloe, your matchless Charms were given
By the all bounteous Hand of Heaven;

So writes your captive Swain.

How comes it then, obdurate Fair!

You see him sink in deep Despair,

Regardless of his Pain?

Think you that is was Heav'n's Design,

With BEARDED-HOOK and Arrows keen,

For you to tyrannize?

Sole Cause of all his Grief and Woe,

No longer slight his Passion so,

But yield him up the Prize!

Think on the LOVE-LETTERS he PENS, 4. 1. 2.

And all to charming *Chloe* sends!

To you he'll prove more true,

Than e'er did *Basso* and *Spadill*,

Or all the Four at dear *Quadrille*,

Than to your Foot your SHOE * 9.

Discard the BUSK from that dear Breast,

And make th' ingenious *Bamfield* blast;

Nor DREAM your Youth away: 3.

Those killing Charms! now in their Prime,

Must yield to all devouring Time,

To Death, a future Day.

* Alluding to a Shoe maker's Last.

In like Manner they were all answered by Mr. E. Hulse, Mr. J. May, Mr. Abr. Clark, Mr. J. Elgar, Mr. John Hollingworth, Mr. Rob. Pitches, Mrs. Aspinwall, M. W. Pommels, Mr. W. Headford, Mr. John Haycroft, Mr. Tho. Dodd, Mr. Rob. Hall, Mr. Geo. Stapely, and others; see the Catalogue.

PARADOX I. by Mr. W. POMMELS.

One Morning in June, I then did presume
A fifty Pound Wager to lay;
Without Lines or Angles my self did entangle,
A large oblong Field to survey.
Now the Work I have done, and the Wager have won;
'Twas paid without any Dispute;
I us'd no Equations, nor no Calculations;
But the Area by Numbers found out.
Kind Gentlemen, if you'll my Method declare;
I'll endeavour to send you a better next Year.

PARADOX II. by Mr. THO. ATKINSON.

A charming Fair I dote upon,	And ever since on each Birth Day
Who's just arriv'd at Twenty-one,	He Fifteen Pounds a-side did lay;
And her officious Sire hath laid	Until that she arrived were
A Portion up for her 'tis said;	At th' Age (above) first mention'd here.
In such a Manner as to prove	Yet I've a Friend that will be bound
The Daughter's Worth, and Parent's To forfeit Life, if there be found	More in the Bag than 90 Pounds,
Love:	If He's th' right, kind Sirs make clear
He at her Birth for her laid by,	How it can be another Year?
Full Fifteen Pounds, or very nigh,	

New MATHEMATICAL QUESTIONS to be answer'd in the next Year's Diary.

(1) Question 61. by Mr. ABR. LORD.

Required the three least Numbers, which, if divided by 20, shall leave 19 for a Remainder; if divided by 19, shall leave 18; if divided by 18, shall leave 17; and so on (always leaving one less than the Divisor) to Unity?

(2) Question 62. by Mr. ROB. PITCHES.

A certain Gentleman hath a circular Field, 154 Rods in Circumference. Now upon a Frolick he hath sold out of the said Ground, an inscribed Triangle, whose Perimeter is to be 120 Rods. And the Buyer is as fond of Ground as *Abab*; nor scarcely will be satisfied until he's admitted into a Piece 4 or 5 Feet deep. Therefore he desires the ingenious Gentlemen of the Annual Diary to exhibit a Method whereby he may make

The Forest Service has no intention of making it possible for his

(4) Question 64. by Mr. W. BEVIL

In how many Times may a Person with (equality of Chance)
8 Dice undertake to throw 29?

(5) Question 65, by Mr. ROX ROBINSON.

Near *Tocket's* Hall an oblong Grotto lies
By Nature form'd to please the wond'ring Eyes;
A Spring doth rise within this shaded Grove,
In Summer Cold, and in the Winter Hot.
A curious *Artist* wanting the Content,
Did at the Water place his Instrument;
And found the Angles 'gainst the longer Sides
To be *as Margin plainly specifies. [*138° 45' and 102° 15'*]
He likewise found that the remoter End,
Just forty three Degrees did there subtend;
The Length twelve Chains, he also did obtain,
And thence defines the Surface of the Plain.

(6) Question 66. by Mr. JOHN ASH.

To determine the Area, and greatest Ordinate, of a Curve whose Equation is $x^4 + y^4 = 40xy$.

(7) Question 67, by Mr. Tho. Cowper.

In what Place of North Latitude,
And Day this Spring o'th' Year
At two o' Clock is Twilight view'd
First in the Atmosphere;

When the Sun's height that Morn
At seven found to be, [illegible]
Degrees not less Twenty-five
But Minutes Forty-three?

(8) Question 68. by Mr. W. KINGSTON.

An Ellipsis, whose Transverse is 80, and Conjugate 60, the greatest inscribed Triangle is just one fourth of the least circumscribing the same. *Quæ*, the said Triangles, and the *Demonstration*?

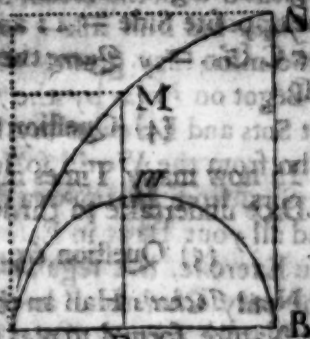
(9) Question 69, by Mr. J. A. TERRY.

Suppose a Cask in the Form of the lower Frustum of two

equal Cones, join'd together upon one common Base; the Diagonal of the said Cask is 30 Inches; and if its Length be multiply'd by two, that Product will be equal to the Diff. of the Head and Bung Diameters. *Quere* the Dimensions of the said Cask, and Content in the Ale Gallons, when a *Maximum*?

Q. Question 70. by MATHE.

Given $y = rxxx = 1,5 xx^2$ where x is an Arc Am of the semicircle AmB , $y =$ any variable Ordinate PM of the Curve AMN , and $x =$ its Abscissa AP ; To find the Area of the Curve space APM , (when $AB = 20$, and $P = 6$) by a general *Theorem*.



New ÆNIGMAS, to be answered next Year.

(1) Ænigma 37. By Mr. RALPH HULSE.

As the intruding Horrors of the Night
Had just depriv'd our Hemisphere of Light;
To the Gods my Sorrows did relate,
And curs'd the spiteful Stars that rul'd my Fate.

— Who's that, said I, that offers to controul
And tie in Magic Chains a Free-born Soul?

The Answer was — *Tisiphone* is sent
From Hell's deep Abyis, for a Punishment!

Whose haughty Pride extends from East to West,
By Gluttons pamper'd, and by Sots careles'd;
For since to me they such Indulgence gave,
In Return have hir'd them, for my Slave.

"The fam'd *Æneas* I do deride,
And o'er his Gally-Pots triumphant ride;

With Courage bold ascend the Royal Throne,
And under-prop the Head that wears the Crown;

On sage *Machiavellists* at Council wait,
And guard from balmy Sleep the Eyes of State;

At Court upon the Bench, I (mounted high)
Rebuke his Lordship, should he walk awry;

Am by Allusion styl'd the Cities Grace,
Since I give solemn Noddles gentle Face!

If not, repose upon some false one's Kne,
To feed on Jellies, and to drink cool Tea."

That

That seldom am from Velvet Slipper free,
 Yet greater Honour still is shewn me;
 "As *Jove* vouchsaf'd on *Iad's* Top to tread;
 "And in *Philemon's* Cott once took a Bed;
 "Pleas'd with the mean, but hospitable Feast;
 "Jove bid him ask — and granted his Request;
 "So mine they grant, who am of Race Divine;
 "Begot on *Venus* by the God of Wine."
 Let Sots and Epicures my Name reveal,
 Who from the World so seldom it conceal;
 If, Sirs, from Harm you would yourselves defend,
 And all your Days in Ease and Freedom spend;
 Use Exercise, live regular each Day,
 The only Charms to keep the Jilt away.

(2) Ænigma 38. by MAMA'S JOYE.

Sirs, my destin'd Fate I intend to relate,
 In a Theme of a Sytical Strain;
 And it is for this Reason, that you may in Season,
 My Name to the Learned explain,
 And first, you shall know, that the Scriptures do shew,
 I once for *Man's* Sin was abused,
 As by Heav'n design'd; but now by Mankind
 I am frequently very ill used.
 For tho' on the Earth I've a Place for my Birth,
 When there I have flourish'd a while;
 Frail *Man* does appear and up does me tear!
 And does me of that Pleasure beguile:
 But more to confound me, he straitway does drown me,
 And then I am punish'd by Fire;
 Yet after all those I am beaten with Blows
 Tho' obnoxious unto my Desire.
 But, from Females more kind, better Usage I find,
 Than those cruel Tyrants did shew;
 For most Dames of the City, and rural Girls pretty,
 Will on me some Favour bestow.
 With their Fingers most neat I'm dress'd up compleat,
 And sometimes from their ruby Lips gain
 A far greater Favour than *Strephon* cou'd ever
 Of his belov'd *Celia* obtain.
 But than *Man* once more (still as bad before)
 As if he did mean my Destruction,
 Does beat me ('tis said) with his Weapons, tho' made
 Of some foreign Nation's Production.

It then at at the last, when these Troubles are past,
Some Advancement I hope to receive
From the Fair, whom I find are still loving and kind,
As I an Example can give,
That 'tis for my Duty) Access to their Beauty
I do very often attain,
And for my Adherence I have such Preference,
That the greatest *Monarchs* can't gain:
Men that before did my Sufferings restore,
Do now more affectionate seem;
For the Beau and the Clown, both in Country and Town,
My Service do highly esteem,
Nor yet when the Beau wou'd his Gallantry shew,
My Service does seemingly slight,
'Tis in the Day his Pride to display
For perhaps he'll embrace me at Night.

(3) Ænigma 39. by Mr. J. A. HALL.

Good Neighbours, redress, a poor Wretch in Distress,
Pray hear me before you reprove me;
'Tis true I'm a Slave, yet so well I behave,
That my Master does very well love me.
Many Years, as 'tis said, I have serv'd at his Trade,
('Tis fit that I shou'd have my Due)
And tho' often oppress'd, I do freely protest,
That I ever was loyal and true.
I've a Head, but what's strange, 'tis ill furnish'd with Brains,
(For why, they but little concern it)
I've a pretty wide Belly, but yet let me tell you,
I ne'er have my Food 'till I earn it.
Nor the *Maple* nor *Ash*, can at all me abash;
Nor the *Box*, nor the Death-bringing *Yew*,
Nor if once in a Rage, I can dare to engage,
With the stubbornest *Oak* that e'er grew!
But I'd have you believe, when these Acts I achieve,
(As they're oft to be seen I am sure)
That I always retreat well loaden with Meat,
Tho' not worth a Morsel before.
Now hear me, alas! my deplorable Case,
How all my Estate lies in Danger:
Behold here how I work, like a Slave to a *Turk*,
And all to make Way for a Stranger.

For I can't make a Den, tho't be never so mean,
 To skreen my poor Back from the Cold,
 But in strait he slips, and Possession he keeps,
 So I'm like to be rarely besbol'd.
 Therefore, prying Sirs, without farther Demurs
 To you I for Justice appeal:
 But beware of all Flaws, in your Suppliant's Cause
 And help me, dear Sirs, do not fail.

(4) *Enigma 40.* by Mr. SAM. HAMMOND.

I have a human Shape but ne'er a Soul;
 A Coat divided into Parts, yet whole:
 Which (being with fine Imag'ry o'erlaid)
 Of Stuff more rich than Silk or Velvets made,
 Four Arms I have, (but tho' I often post
 From Place to Place) no Legs or Wings can boast;
 Yet run and fly so swift that you wou'd guess
 Me made of nothing else: Such Charms possess,
 (Tho' of Complexion fallow, like the poor
 Bare-headed *Turkish* Slaves who tug the Oar)
 That I by all Degrees am much admir'd;
 By all Degrees am ardently desir'd.
 My Body's oft compared to the Sun,
 But many Circles more than he have run;
 And rise and fall as mighty States have done.
 Like ancient Families I bear the Name
 O' th' Place from whence my first Ancestors came,
 Who being by the *English* naturaliz'd,
 I'm as the best of *British* Subjects priz'd.
 Yet Slave to those who're Slaves to me; by Birth
 Deriv'd (like *Adam*) from the Dust o' th' Earth:
 Like him too born mature, and pass for more
 Than twenty, tho' but born the Day before.
 I'm sometimes Male, sometimes Hermaphrodite,
 Sometimes the Sex which Man doth so delight:
 As was the first o' th' Name who flourish'd here
 In *Besse's* Reign, as Records make appear.
 I of Access am hard, but that once gain'd
 Am more familiar than your dearest Friend;
 As courteous to the Clown as to the Squire
 But from the former sooner do retire:
 For (to my Shame) this Fault must be confest;
 I oft desert the Man that loves me best;

ho' whosoever any Acquaintance gains,
sure to be rewarded for his Pains.

(5) Enigma 41. by Mr. SAM. BARNES.

E'er since resurgent *Sol* with Splendor shone
preading his Beams around th' empyreal Throne;
E'er since huge Worlds have had their Residence,
and travel'd to and fro in Space immense,
existence I've obtain'd, and it is plain
till the great Conflagration shall remain
m of three Kinds, yet of one Substance made;
and as ascend oft-times I retrograde,
sometimes I am metamorphos'd in descent,
The liquid to indurate Parts cement;
and then Parts globular I freely shed;
another Time, soft as the downy Bed,
may say one Kind more (and no wise erring)
it's neither Fish, nor Flesh, nor Pickle-herring
have my Rise from the Terraqueous Ball,
and when I've soar'd a while, down, swiftly fall;
E'en as the warbling Lark that upwards goes
When sung his Song, down drops from whence he rose.
I in ten thousand different Shapes appear,
and all Variety of Colours wear:
irregularly move; for sometimes I
Keep Pace with Snail; at others swiftly fly
With such Velocity, that Mortals here
from my black Aspect swiftly run for fear.
Sometimes of such inviting, beauteous Hue
Mankind with Pleasure and with Wonder view
To imitate *Artists* have wrought their Parts
Which shews th' Inferiority of Arts.
Tho' I have here endeavour'd to conceal
What's Dark itself — 'tis vain; you'll soon the same reveal.

(6) Enigma 42. by ANT. MOOR.

Attend my Lay, ye ridd'ling Wits of Fame,
Explore the Truth, and tell the World my Name.
To me Mankind their greatest Blessings owe;
From me their Joys, from me their Pleasures flow.
Me! Mortals as their Guardian pow'r adore,
And, next to Life, my Blessings they implore.
Tis I, when Mirth and Liquor feast the Soul,
Support the Joy, and crown the laughing Bowl.

Mankind

Mankind, as I vouchsafe to smile, or frown,
 Find Ease in Chains and Anguish in a Crown.
 How oft, when Sickness wrings the tortur'd Heart
 'Am I implor'd; to cure the pungent Smart?
 How oft the Debauchee my Aid requires,
 When his parch'd Stomach burns with livid Fires?
 Yet seldom I appear where Luxury reigns
 And Joy attended with succeeding Pains,
 But lest I still shou'd too mysterious prove,
 One Hint I'll offer and the Mask remove;
 I make *Belinda's* Charms more charming grow,
 And on her Lips eternal Smiles bestow:
 Redden each Cheek, improve each killing Grace;
 And breath a blooming Vigour in her Face.

(7) *Enigma 43.* by Mr. CHR. MASON.

I claim from the Earth, (like *Adam*) my Birth,
 My Shape is like that of the Sun:
 On an Axis I play by Night or by Day
 And tear and am torn as I run.
 I turn swiftly round, and always am found,
 By sprink'ling my Force to renew;
 What makes all Things grow, I consume as I goe.
 But what is most wond'rous to view;
 Tho' Water is found to fertile the Ground,
 To Fire 'tis always reverse;
 Remember that I (without any Lie)
 My Flames in the Water disperse!

(8) *Enigma 44.* by Mr. W. HEAFORD.

I from my Mother's Womb was forc'd away,
 And lodg'd upon a frigid Bed of Clay;
 While many Days and darksome Nights were spent,
 Upon my earthly Couch I lay content.
 At length I was attack'd by Foot and Horse,
 And then compell'd to quit the Field by Force.
 But it wou'd make the hardest Heart relent,
 To think what Sufferings then I underwent;
 Into a burning Furnace I was thrown.
 There with unpy'd Grief to make my Moan:
 Alas! such Torments then I'm forc'd to bear,
 Wou'd make the stoutest Hero quake for fear.

length I in another Shape must be,
 when smooth's my Skin and from Uncleanneſs free;
 and when transform'd, and alter'd in my Frame,
 from that Time receive another Name;
 next to *Agus* may be term'd for Eyes;
 not neither halfſo vigilant, nor wiſe.
 The Ear I have which to my Body grows;
 neither Lips, nor Teeth, nor yet a Noſe.
 Whenever I am fed, by Night, or Day;
 my Head is from my Body forc'd away.
 often uſed by the tender Fair,
 and to ſupply their Want is all my Care:
 let off they ſeize me (mark the ſtrange Surprize)
 and ſhake me till my Guts come through my Eyes!
 or is their Cruelty, from that Time ceaſ'd;
 they ſcorch my Bowels, and upon them ſeaſt.
 that I ſhall fill relenting Hearts with Grief,
 and my Complaint will yield but ſmall Relief.
 Then pray declare from whence you think I came,
 My Birth, my Parentage, alſo my Name?

An *Alphabetical Catalogue* of CONTRIBUTORS to this
 Diary, ſhewing by the Numerical Letters i, ii, iii,
 &c. which Queſt. and by 1, 2, 3, 4, &c. what
 Enigma's each answered.

Mr. *John Aſh* all Qu. and all *Æ.* and prop. 1. *Amanueſis* all but 5.
 and 8. *Arabella* all but 9. Miſs *Aspinwall* all *Æ.* in Verſe. Mr. *Tbo. Ar-*
uſen ii. iii. vi. vii. x. and all *Æ.* in Verſe. Mr. *Rich. Abbot* all but 2
 and 9. *Academicus* i. v. vii. and all but 9. *Anaximander* all but v. and 8.
 Mr. *Euſt.* all *Æ.* in Verſe. Mr. *John Brown* 3. 4. 5. 6. 7. 8. 9. all but 2. and 9.
 and Moon's Eclipse. *Buccephalus* 1. 3. 4. 5. 6. 7. 8. 9. Mr. *Will. Bowſ* ii. iv. viii.
 all *Æ.* but 9. Mr. *Ant. Baker* ii. iii. iv. v. viii. ix. and all *Æ.* but 8.
 prop. 1. Qu. and one *Æ.* Mr. *Sam. Bamfield* iii. v. all *Æ.* prop. 1. Mr.
B. Bottrill all *Æ.* Verſe but 4. and 9. Moon's Eclipse. Mr. *Edw. Boyd* iii.
 vi. viii. ix. *Lucius Cræſſus* all *Æ.* Tom. Cant. all but 9. Mr. *J. Calvert* 4.
 all *Æ.* prop. 1. Mr. *Abr. Clark* all *Æ.* in Verſe. Ecl. Mr. *Ben. Claridge*
 6. 8. prop. 1. Qu. and 1. *Æ.* Mr. *John Cheſter* all *Æ.* in Verſe.
 Mr. *Tbo. Cowper* all but ii. v. all but 4. 5. and 9. Moon's Ecl. Occul-
 tion. and prop. 1. Qu. Mr. *Tbo. Coats* all *Æ.* in Verſe. Miſs *Bottrill* all
 5. and 9. Mr. *Tbo. Dodd* i. iii. viii. all but 4. in Verſe, and Ex-
 lipſes.

lipes. Mr. Geo. Dennis iv. viii. 1. 2. 3. 4. 6. 9. Mr. James Elgar
vii. x. all *Æ*. in Verse, Moon's Ecl. &c. Mr. Tho. Grimes ii. viii. all
but 3. and 4. Mr. Tho. German i. ii. vi. Mr. Hen Gilbert viii. 1. 4.
Tom. Gingle all *Æ*. in Verse. Mr. Tho. Garrard iii. v. Mr. Rich.
bons all but iii. ix. all *Æ*. in Verse. prop. 1 Qu. and 1. Par. Ned. G.
i. iv. x. all *Æ*. Mr. John Hollingworth all in Verse and Eclipses.
Hern prop. 2 *Æ*. Mr. Ralph Hulse all *Æ*. in Verse. prop. 4. Eclipses.
a perpetual Table of the Moon's Change, Mr. Will. Henford all but
and 9 in Verse. prop. 1. *Æ*. Mr. John Haycroft 4. all *Æ*. in V.
Par. prop. 1 Qu. and 1. *Æ*. Mr. Tho. Hayward all *Æ*. in Verse.
Tho. Hare iii. viii. all but 9. prop. 1. Qu. Mr. James Hall all *Æ*.
Verse and prop. 1. Mr. Sam. Hammond all *Æ*. in Verse. prop. 1. and 1.
Mr. Rob. Hall. 4. 8. all in Verse. Mr. Tho. Harbridge Moon's Ecl.
Maria Hurlstbrumbo all *Æ*. in Verse. Jobbervall all *Æ*. in V.
Ignities ii. Mr. Will. Jephson iii. iv. vii. viii. ix. all *Æ*. in Verse prop. 1.
Mr. J. James Eclipse. Miss Jenkins all *Æ*. but 9. Idstbea all *Æ*.
and 9. Idomeneus ii. v. ix. 1. 3. 4. 7. Mr. Will. Kingston all but
all *Æ* but vii. prop. 1. Qu. Kunigunda 1. 4. 7. 8. Mr. Abr. L.
all Qu. and all *Æ*. but Moon's Ecl. Lucullus ii. vi. Mr. Ant. M—
but 3, 7. in Verses. Ma'ma's Joye all *Æ*. in Verse prop. 2. Mr.
Morton iii. all but 3. 4. Mr. Chr. Mason all *Æ*. in Verse. prop. 4.
and 2 *Æ*. Mr. Ant. More prop. 1. Qu. Mr. Tho. Mese 1. iii. v.
viii. x. Mr. Will. Mobbs all *Æ*. in Verse. prop. 1. and Moon's Eclipse.
Jef. Pilgrim iii. 1, 2, 3, 6, 7, 8. prop. 1. Qu. Mr. Will. Pam
iii. iv. all *Æ*. in Verse. 1. *Æ*. prop. and 1. Par. Mr. Rob. Pitcher
iv. ix. all *Æ*. in Verse prop. 2. Qu. Don Quixote all *Æ*. Mr. R.
Robinson all Qu. Rabbinus all *Æ*. Mr. Cha. Smith all but 5. and
Mrs. Sarab Smith all *Æ*. in Verse. Mr. T. Skay Eclipses. Mr. T.
Sparrow Moon's Eclipse. Mr. Geo. Stapely all but i. and ii. all *Æ*.
1. Qu. Sabina all but 9. Mr. John Todd, all but iii. prop. i. Mr. J.
Terey ii. iii. iv. ix. and prop. 1 Qu. Mr. John Turner all Qu. Mr. J.
Williams 1. iii. iv. viii. ix. Mr. Jof. Walker 1. 2. 3. 6. 8. and Eclipse.
Mr. John White viii. Dion Williams iv. viii. all *Æ*. but 5. and 7. Mr.
Tho. Worcester all Qu. and all *Æ*.

N. B. We have also receiv'd very accurate and concise Solu-
tions to all the Questions, with the D's Eclipse for the Meri-
dian of Retford, from Gamston Retford. The Favour is grate-
fully acknowledged; but his Letter came quite too late to
have any thing inserted at large, in this *Diary*.